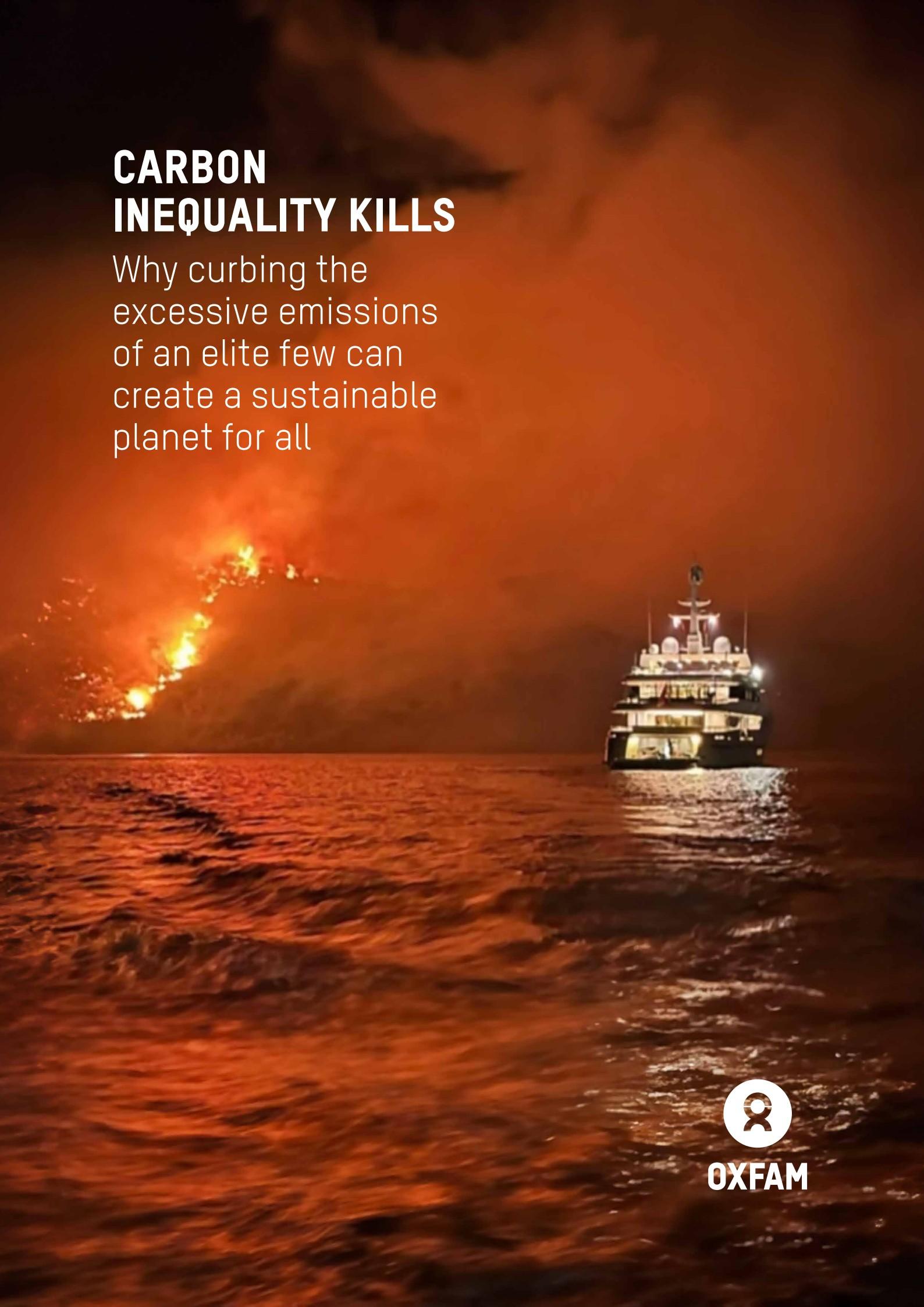


CARBON INEQUALITY KILLS

Why curbing the excessive emissions of an elite few can create a sustainable planet for all



OXFAM

BRIEFING NOTE, OCTOBER 2024

The only way to beat climate breakdown and deliver social justice is to radically reduce inequality. This briefing paper reveals the catastrophic climate impacts of the richest individuals in the world, and proposes taking urgent action to protect people and the planet.

What little carbon dioxide we can still safely emit is being burned indiscriminately by the super-rich. We share new evidence of how the yachts, jets and polluting investments of 50 of the world's richest billionaires are accelerating the climate crisis. Oxfam's research shows that the emissions of the world's super-rich 1% are causing economic losses of trillions of dollars; contributing to huge crop losses; and leading to millions of excess deaths.

As global temperatures continue to rise, risking the lives and livelihoods of people living in poverty and precarity, we must act now to curb the emissions of the super-rich, and make rich polluters pay.

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Cover photo: A forest fire in Hydra, Greece, June 2024. A luxury yacht with a forest fire in the background.

Credit: Firefighters took this photo [as stated on a BBC article]

Page 7: An open door into a private jet, taken at sunset.

Credit: halbergman/istockphoto

Page 14: A desertified land at a family farm in Al-Wahat city, Lahj governorate, Yemen.

Credit: Gabreez/Oxfam

Page 27: Climate activists Hilda Nakabuye and Marinel Ubaldo join a climate march in New York in September 2024.

Credit: Karelia Pallan/Oxfam.

INTRODUCTION: WHY CARBON INEQUALITY MATTERS

THE DWINDLING CARBON BUDGET

In 2015, 196 countries agreed the target of limiting global warming to *no more than 1.5°C* above pre-industrial levels as part of the Paris Agreement.¹ Exceeding this would have disastrous consequences. According to the Intergovernmental Panel on Climate Change (IPCC), a 1.5°C increase is unsafe for most countries, communities and ecosystems, and would disproportionately affect disadvantaged populations through food insecurity, higher food prices, loss of income and livelihood opportunities, adverse health effects and population displacement.²

The years 2023 and 2024 have experienced record-breaking heat, temporarily surpassing the 1.5°C threshold.³ This highlights the accelerating pace of climate change and indicates that the window to stay within the safe 1.5°C limit is rapidly closing.

To enable even a 50% chance of keeping global warming below 1.5°C, global emissions cannot exceed 250 gigatonnes of CO₂.⁴ This is what scientists call the ‘remaining carbon budget’. If the world continues its current emissions, we will use up this budget by January 2029.⁵ This presents a real and imminent threat to the future of life on earth.

Who is burning through the carbon budget? And who is paying the price?

The evidence is clear: the world’s richest people are using a disproportionate amount of the world’s remaining carbon budget and setting us all on course for irreversible and catastrophic global warming.

Half of the world’s emissions come from the richest 10% of people. The wealthiest 1% by income account for 16% of emissions, which is more than the poorest two-thirds of people in the world.⁶ As this paper shows, the consumption and investment habits of the richest billionaires are burning through the carbon budget.

- If everyone began emitting as much carbon as those in the top 10%, the remaining carbon budget would be gone in less than a year and a half.
- If everyone began emitting as much carbon as those in the top 1%, the remaining carbon budget would be gone in fewer than five months.
- If everyone emitted carbon at the same rate as the luxury transport emissions of 50 of the world’s richest billionaires, the remaining carbon budget would be gone in two days.⁷

A major cause of overconsumption and emissions among the richest is their yachts and jets. A superyacht alone, kept on permanent standby, generates around 7,000 tonnes of CO₂ a year.⁸ Wealth data also tells a clear story about the intersection of social, gender and economic inequalities. Private jet owners are overwhelmingly older men (aged over 55) who work in banking, finance and real estate.⁹

The evidence from this briefing paper is clear: the world’s richest people are using a disproportionate amount of the world’s remaining carbon budget and setting us all on course for irreversible and catastrophic global warming.

The majority of the richest 1% and 10% of people in the world live in countries with high historical emissions.¹⁰ These countries bear great responsibility for bringing the world to the brink of climate catastrophe through the pursuit of economic growth at any costs, in large part through a reliance on fossil fuels.

5 CARBON INEQUALITY KILLS
WHY CURBING THE EXCESSIVE
EMISSIONS OF AN ELITE FEW
CAN CREATE A SUSTAINABLE
PLANET FOR ALL

FIGURE 1 THE CONSEQUENCES OF CARBON EMISSION



Box 1: Where do the world's richest polluters live?

Historically, most of the global super-rich 1% and rich 10% lived in high-income countries such as the USA and European Union (EU) member states. In 2019, over 60% of the super-rich 1% and rich 10% were citizens from high-income countries,¹¹ while 76% of the 50 billionaires in our study are citizens from high-income countries.¹²

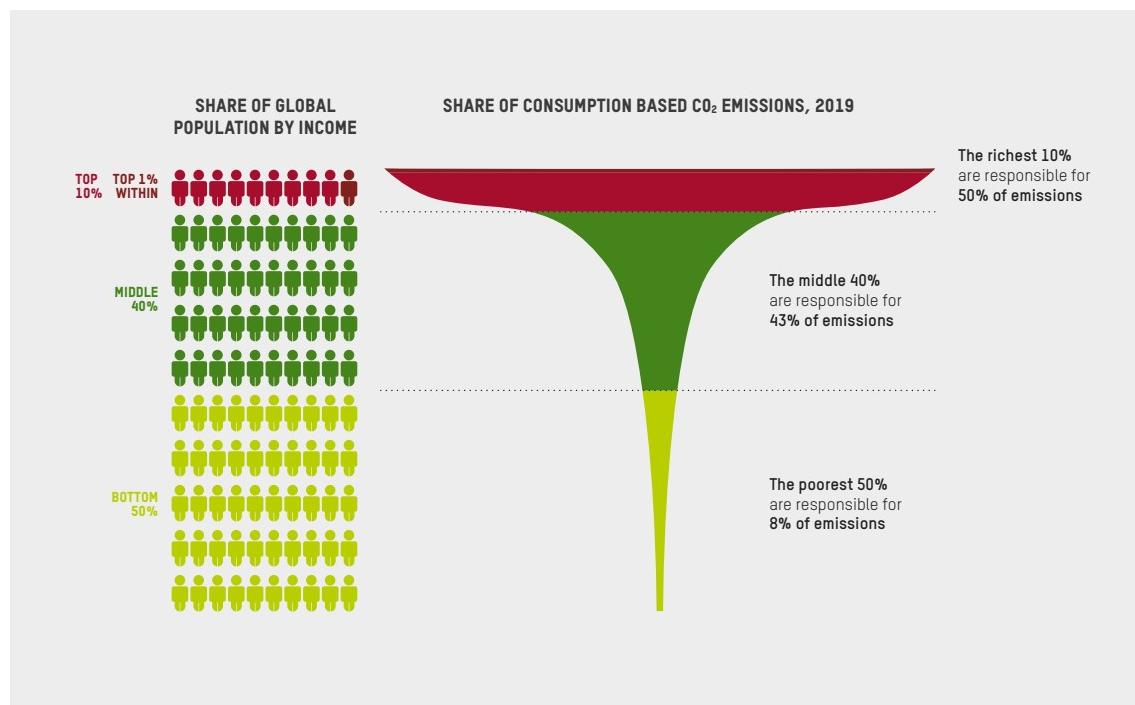
The rich people living in these countries have benefited from the economic growth that these emissions enabled, and they also have the resources to protect themselves from negative climate effects. By contrast, the poorest half of humanity has barely contributed to decades of carbon pollution.¹³ Yet these are the people who are being hit hardest by climate changes.

For example, East Africa has historically contributed almost nothing to global carbon emissions, and the emissions of the poorest communities in this region are negligible. But it is one of the regions worst hit by climate change, with people living in poverty left to suffer the deadly consequences. Extreme weather, causing droughts in Ethiopia, Kenya and Somalia, and floods in South Sudan, left 31.5 million people facing acute hunger in 2023.¹⁴

To keep global temperatures from rising above 1.5°C, the IPCC says that global emissions must halve from 2010 levels by 2030 and be at zero by 2050.¹⁵ The only way to achieve this is for the wealthiest and most polluting people and countries to reduce their emissions furthest and fastest. This will not happen without unprecedented and urgent action from governments around the world. Keeping the world below a 1.5°C rise requires the emissions of the richest 1% to drop by 97% by 2030, a world away from the 5% decrease that current trends predict.¹⁶

FIGURE 2 THE GLOBAL RICHEST 10% ACCOUNT FOR 50% OF CARBON EMISSIONS

Share of global emissions by income group



Source: Oxfam (2023).¹⁷

SECTION 1

THE

POLLUTER

ELITE



SECTION 1. THE POLLUTER ELITE

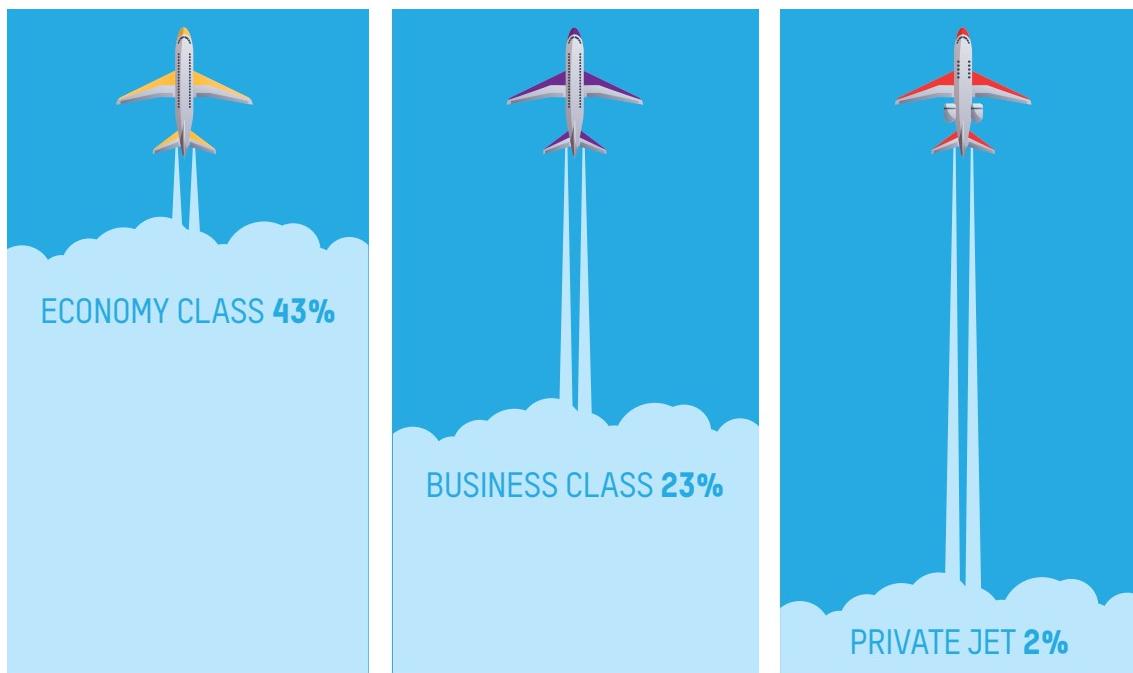
This section presents new data on luxury transport consumption (private jets and superyachts) and the investment emissions of the world's 50 richest people. It builds on Oxfam's previous climate and inequality reports with fresh evidence of how the very wealthiest are making a decisive contribution to planetary destruction. We find that the emissions from the investments, private jets and superyachts of 50 of the world's richest people is more than the consumption emissions of the poorest 2% (155 million) of people combined. In just over an hour and a half, through their investments, superyachts and private jets, a billionaire will emit more than the average person will emit in their lifetime. Our research signals that climate breakdown cannot be avoided without reducing excessive wealth concentration among an elite few. We must take urgent action to dramatically change the consumption and investment habits of the richest people.

LUXURY TRANSPORT CONSUMPTION EMISSIONS

Addiction to private jets

Most people contribute very little to emissions from air travel. Only 2–4% of the world's population fly internationally and just 1% of people are responsible for half of all plane emissions.¹⁸ Extreme wealth is adding fuel to the fire of the climate crisis by increasing access to luxury air travel and private jets for the richest few.

FIGURE 3 PASSENGERS IN ECONOMY CLASS PAY MUCH HIGHER TAX THAN PEOPLE FLYING IN PRIVATE JETS
The proportion of air tax (%) relative to flight ticket prices

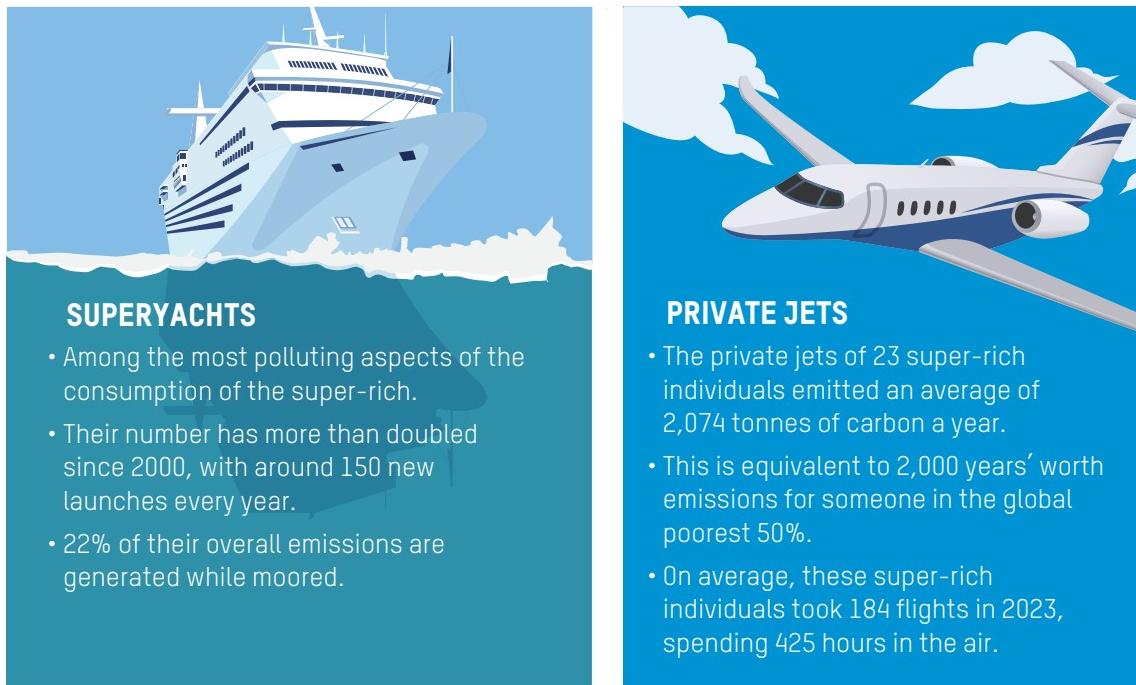


Source: Adapted from Possible. (2023). *Jetting Away with it*.¹⁹

Sales of high-polluting private jets have doubled in the last two decades,²⁰ and governments are failing to disincentivize this behaviour. On a typical flight from Paris to London, only 2% of the private jet price is tax, compared to 43% for economy class ([Figure 3](#)).²¹

Millionaire Stephen Price, Vice-Chair of Patriotic Millionaires, who sold his jet after learning about its environmental impact, has described private jets as being as addictive as cocaine,²² and Oxfam's research confirms that the richest billionaires rely heavily on them.

FIGURE 4 EMISSIONS FROM PRIVATE JETS AND SUPERYACHTS



Oxfam was able to identify the private jets belonging to 23 of 50 of the world's richest billionaires; the others either do not own private jets or have kept them out of the public record.²³

Billionaires go to great lengths to fly under the radar, concealing their sky-high private jet emissions. A recently passed bill in the US Congress now allows jet owners to anonymize their registration information,²⁴ a longstanding demand of the wealthy elite. Oxfam faced several challenges in gathering private jet data for this report, including several aircrafts being blocked from public tracking lists. Bernard Arnault, CEO of the LVMH luxury goods company, sold his private jet to avoid being tracked. He said, ‘the result now is that no one can see where I go because I rent planes when I use private planes’.²⁵ These tactics allow the super-rich to evade accountability for the climate damage they are causing.

On average, these 23 billionaires each took 184 flights – spending 425 hours in the air – over a 12-month period. That is equivalent to each of them circumnavigating the globe ten times.²⁶ The carbon emissions of their private jets are also huge. On average, the private jets of these 23 super-rich individuals emitted 2,074 tonnes of carbon a year. This is equivalent to 300 years' worth of emissions for the average person in the world, or over 2,000 years' worth for someone in the global poorest 50%.

Elon Musk, the second richest person in the world,²⁷ owns (at least) two private jets which together produce 5,497 tonnes of CO₂ per year. This is the equivalent of 834 years' worth of emissions for the average person in the world, or 5,437 years' worth for someone in the poorest 50%.

The two private jets owned by Jeff Bezos, founder and executive chairman of Amazon, collectively spent almost 25 days in the air, emitting 2,908 tonnes of CO₂. It would take the average US Amazon employee almost 207 years to emit that much.

Wealth data also tells a clear story about the intersection of social, gender and economic inequalities in overconsumption and emissions. Private jet owners are overwhelmingly older men (aged over 55) who work in banking, finance and real estate.²⁸

Despite these extraordinary emissions statistics, there is hope. Following protests by Greenpeace and Extinction Rebellion,²⁹ Schiphol, the biggest airport in the Netherlands, announced it was going to ban private jets by 2026,³⁰ although this has been dismissed by the new government.



Activists ground a private jet for six and a half hours in Amsterdam.Credit: Marten van Dijk/Greenpeace Netherlands (2022).

Super-polluting superyachts

Superyachts are among the most polluting aspects of the consumption of the super-rich. The number of superyachts has more than doubled since 2000, with around 150 new launches every year.³¹ Not only do these giant ships guzzle an immense amount of fuel for propulsion, their air-conditioning, swimming pools and extensive staff further add to emissions. Although they are moored for most of the year, about 22% of their overall emissions are generated during this 'down time'.³² The yachts also often have support vessels for staff, helicopters with their own fuelling needs, and air-conditioned hangers.³³

Despite this, superyachts are exempt from both EU carbon pricing³⁴ and International Maritime Organization emissions rules.³⁵

Oxfam was able to identify 23 superyachts owned by 18 of the 50 billionaires in our study. These floating mansions travelled an average of 12,465 nautical miles a year: this is equivalent to each superyacht crossing the Atlantic almost four times.³⁶

Oxfam estimates the average annual carbon footprint of each of these yachts to be 5,672 tonnes, which is more than three times the emissions of the billionaires' private jets. This is equivalent to 860 years of emissions for the average person in the world, and 5,610 times the average of someone in the global poorest 50%.³⁷

The Walton family, heirs of the Walmart retail chain, own three superyachts worth over US\$500m.³⁸ They travelled 56,000 nautical miles in a year with a combined carbon footprint of 18,000 tonnes: this is equivalent to the carbon emissions of around 1,714 Walmart shop workers.³⁹ The company that has generated their extreme wealth has also been found to drive economic inequality in the USA through low wages, workplace discrimination and huge CEO pay.⁴⁰



Most billionaires' superyachts have at least one helipad. Credit: Wirestock/istockphoto

In less than a fortnight, the emissions from a billionaire's superyachts and private jets are more than the average person will emit in their lifetime.⁴¹

INVESTMENT EMISSIONS

The richest 1% control 43% of global financial assets, and billionaires control (either as CEOs or principal investors⁴²) 34% of the 50 largest listed companies in the world, and 7 out of the 10 largest.⁴³ The investment footprint of the super-rich is the most important element of their overall impact on people and the planet.

Investment emissions matter for two reasons:

1. It is vital to understand the true scale of the emissions generated by the richest people in our society, and to analyse the role that these emissions play in climate breakdown.
2. By looking at how the richest behave as investors, we can demonstrate not just their roles as consumers of carbon but also as wealth-holders who own, control, shape, and financially profit from production processes that release greenhouse gases (GHGs) into the atmosphere.

Ordinary people often do not have a lot of control over their energy choices, particularly those in low- or middle-income groups. For example, limited public transport options can mean that people are forced to drive to work. In contrast, investors can choose where they put their money. They can choose to invest it in fossil fuels and other highly polluting industries, or in green initiatives. The decisions that investors make now can potentially determine our emissions for decades to come – for example, bad decisions on infrastructure investments can commit us to high levels of GHGs far into the future. Rich people are not only higher emitters because of their investments, but because investment emissions are a matter of choice. They have a responsibility to use their power to bring a rapid end to fossil fuel extraction and use, and to bring about a rapid and dramatic reduction in the carbon emissions of the corporations in which they are invested.

Oxfam's methodology for calculating investment emissions looks at the stakes that billionaires have in different corporations and the published emissions of those corporations (see the *Carbon Inequality Kills: Methodology Note* for further detail).

Oxfam's analysis found that investment emissions are the most significant part of a billionaire's carbon footprint. The average investment emissions of 50 of the world's richest billionaires were around 2.6 million tonnes of CO₂ equivalents (CO₂e) each. That is around 340 times their emissions from private jets and superyachts combined. Each billionaire's investment emissions are equivalent to almost 400,000 years of consumption emissions by the average person, or 2.6 million years of consumption emissions by someone in the poorest 50% of the world.⁴⁴

Almost 40% of the investments analysed in Oxfam's research were in highly polluting industries including: oil, mining, shipping, and cement. Only one billionaire, Gautam Adani, has significant investments in renewable energy – which account for 18% of his overall investment portfolio. Just 24% of the companies that these billionaires invested in have set net-zero targets.⁴⁵

Box 2. Fashion, finance and tech are in the high-polluters club too

In its calculations, Oxfam has counted only investments in oil, mining, shipping, airlines, and cement as 'highly polluting'.

However, studies have shown that other sectors, such as fast fashion and technology, are likely to be just as highly polluting, when the true cost of emissions are taken into account. These sectors are also contributing to the climate crisis, whether it is through the impacts of supply chains and material use in the fashion industry or, in the technology industry, the full carbon cost of cloud computing and massive data centres, with one data centre consuming the same electricity as 50,000 homes.⁴⁶

When fashion and retail is included as a highly polluting sector, the proportion of these billionaire investments that are considered polluting rises to almost two-thirds.⁴⁷ In addition, two major billionaire-owned technology companies, Amazon, and Google's parent company Alphabet, have emissions comparable to major shipping companies.⁴⁸

Corporate emissions are divided into direct (Scope 1), indirect (Scope 2) and value chain (Scope 3). On average, 75% of a corporation's emissions come from its Scope 3 emissions,⁴⁹ but the majority of companies do not report Scope 3 emissions and so they could not be included in the overall calculations.

Almost all financial services' emissions are Scope 3 emissions, resulting from its lending, investment, and insurance underwriting activities. These are called 'portfolio emissions' or 'financed emissions'.⁵⁰ A report by the Carbon Disclosure Project estimates that the portfolio emissions of global financial institutions are on average 700 times larger than their direct emissions.⁵¹ In Oxfam's sample of 50 billionaires, none of the five billionaires who have their wealth derived from the financial sector have disclosed their portfolio emissions, leading to their impact on the climate being hugely underestimated. For example, Oxfam's estimates based on the emissions of the top 10 holdings of the Blackstone Group, run by billionaire Stephen Schwarzman, show that its total financed emissions are likely to exceed 150 million metric tonnes, vastly greater than their publicly disclosed emissions.

Oxfam's research also found that many of the corporations that 50 of the world's richest billionaires are invested in are known to lobby against good climate policy. Only two companies get a 'B' rating in the Influence Map database,⁵² which indicates support for climate policy aligned with the Paris Agreement.⁵³ Other corporations, such as Cargill, and Berkshire Hathaway, receive 'D+' and 'E' grades, indicating 'obstructive climate policy engagement'.⁵⁴

In addition, at least one-quarter of the billionaires registered at COP28 made their fortunes from highly polluting industries.⁵⁵ It seems reasonable to assume that their interests would be at odds with the international agreements and policy changes needed in this crucial forum to drastically cut emissions.

The climate-protecting potential of billionaire wealth

The wealth of the world's 2,781 billionaires has soared to US\$14.2 trillion.⁵⁶ If it was invested in renewable energy and energy efficiency measures by 2030, this wealth could cover the entire funding gap between what governments have pledged and what is needed to keep global warming below 1.5°C, according to estimates by the International Renewable Energy Agency.⁵⁷

On average, a billionaire's investment portfolio is almost twice as polluting as an investment in the S&P 500, but if their investments were in a low-carbon-intensity investment fund their investment emissions would be thirteen times lower.

It is clear, however, that billionaires will not choose to make such wholesale changes to their investments, or to lobby in favour of progressive and urgent climate action. They will continue to put their own profit before the needs of the many or of the planet. While they remain extremely rich, their luxury consumption will continue to thrive and to burn through our carbon budget.

This is why governments must step in with regulation and taxation to invest in a green transition, and to curb extreme wealth and the carbon-intensive consumption and investment that goes with it. **Section 3** sets out Oxfam's recommendations for much-needed action on climate inequality, but **Section 2** first presents new evidence of the extent to which the polluter elite are driving up inequality, hunger, and mortality rates.



If billionaire wealth is invested in renewable energy and energy efficiency measures, it has huge climate-protecting potential.
Credit: Windcolours/Shutterstock.

SECTION 2

HOW THE EMISSIONS OF THE RICHEST ARE FUELING INEQUALITY, HUNGER AND DEATH



SECTION 2. HOW THE EMISSIONS OF THE RICHEST ARE FUELLED INEQUALITY, HUNGER AND DEATH

This section presents a new analysis of the inequality in the impacts of climate breakdown. It shows how the excessive emissions of the world's richest people are driving up temperatures to a level that significantly reduces economic output and exacerbates inequality. These increased temperatures lead to crop losses, intensify hunger, and cause excess deaths and increase mortality rates. The outsized emissions of the rich are inflicting extreme and avoidable suffering on many, particularly on the poorest countries and people.

The outsized emissions of the rich are inflicting extreme and avoidable suffering on many, particularly on the poorest countries and people.

Oxfam's decades of experience working with people living in poverty and communities hit by weather-related disasters have shown that it is women and girls, marginalized groups, and people living in poverty who are hardest hit, in both the Global North and Global South. Meanwhile, the richest have the resources and power to shield themselves from harm.

Wealth and income inequality intersect with race, gender, ethnicity, age, and disability, leading to increased discrimination and exclusion of those groups that are already sidelined and marginalized. This creates even greater vulnerability to climate impacts.

As the severity of climate change impacts escalates, so does the gap between the rich and the poor, and between Global North and Global South countries. This continues a vicious cycle of inequality.

Box 3. How impacts on economies, crops and deaths have been calculated

The research underpinning **Section 2** quantifies the responsibility that rich groups bear for the key impacts of climate changes suffered globally, regionally, and in every country. Combining physical climate models and empirical impact models, the research first estimates the degree of heating that can be attributed to the emissions of the rich and then assesses the damage that heating causes. It considers economic damages, crop losses and excess deaths due to heat, building on earlier research.⁵⁸

The analysis is based on the consumption emissions of the world's super-rich 1% and rich 10% (by income, as calculated by the Stockholm Environment Institute and Oxfam),⁵⁹ and the investment emissions of 50 of the world's richest billionaires (based on Oxfam's analysis outlined in **Section 1**). Double-counting of emissions has been avoided.

It is important to note that the estimates presented are conservative, as emissions have been considered over a limited period and only impacts caused by temperature changes have been considered. Impacts caused by other climate-related drivers such as floods and hurricanes will be in addition to those estimated here. Equally important is the fact that the harms focused on in this analysis by no means fully represent the wide array of losses and damages felt by people, which are in many cases not even quantifiable.

A note: In this section, economic damages are expressed in International Dollars (\$), which adjusts for Purchasing Power Parity (PPP). Taking this approach allows for a fairer comparison of climate damages since International Dollars (\$) better account for differences in the cost of living between countries. Using United States dollars (US\$) – as done commonly in early climate economic literature – would downplay harms caused to lower-income countries. Recently, using International Dollars has become a more accepted method in climate economics literature.

THE EMISSIONS OF THE RICHEST ARE FUELLED INEQUALITY

Hotter temperatures impact annual economic growth. They can decrease productivity, leading to economic damages, as well as improve productivity in countries that are below an optimal temperature, generating economic gains.⁶⁰ These changes in economic output occur due to changes in labour productivity, agricultural productivity, and energy use.⁶¹

The analysis finds that the emissions of the richest are contributing to higher temperatures that significantly reduce global economic output. Focusing on the consumption emissions of the world's super-rich 1%, those outsized emissions alone lead to substantial declines in economic output in hotter (mostly Global South) countries and increased outputs in cooler (mostly Global North) countries. This means that economic inequalities between countries are and will be larger than they would be in a world without the outsized consumption emissions of the world's super-rich 1%.



The Sanaag region of Somalia, where Oxfam has built a water supply system for people and animals. Credit: Pablo Tosco/Oxfam (2022).

Killing our economies

At a global scale, the findings show that:

- Three decades of consumption emissions by the world's super-rich 1% (1990–2019), have already caused global economic output to fall by \$2.9 trillion between 1990 and 2023. By 2050, the economic damage of only four decades of emissions (1990–2030) rises to \$52.6 trillion, equivalent to a loss of 0.5% of global cumulative GDP between 1990 and 2050.⁶²
- The consumption emissions of the world's richest 10% (1990–2019) have already caused global economic output to fall by \$8.6 trillion between 1990 and 2023. About as much damage was caused by the COVID-19 pandemic in 2020, which led to massive economic and social disruption in the world and caused global poverty levels and inequality to surge.⁶³ By 2050, four decades of consumption emissions (1990–2030) by the world's richest 10% will cause economic damage totalling \$150 trillion, equivalent to a loss of 1.5% of global cumulative GDP between 1990 and 2050.⁶⁴

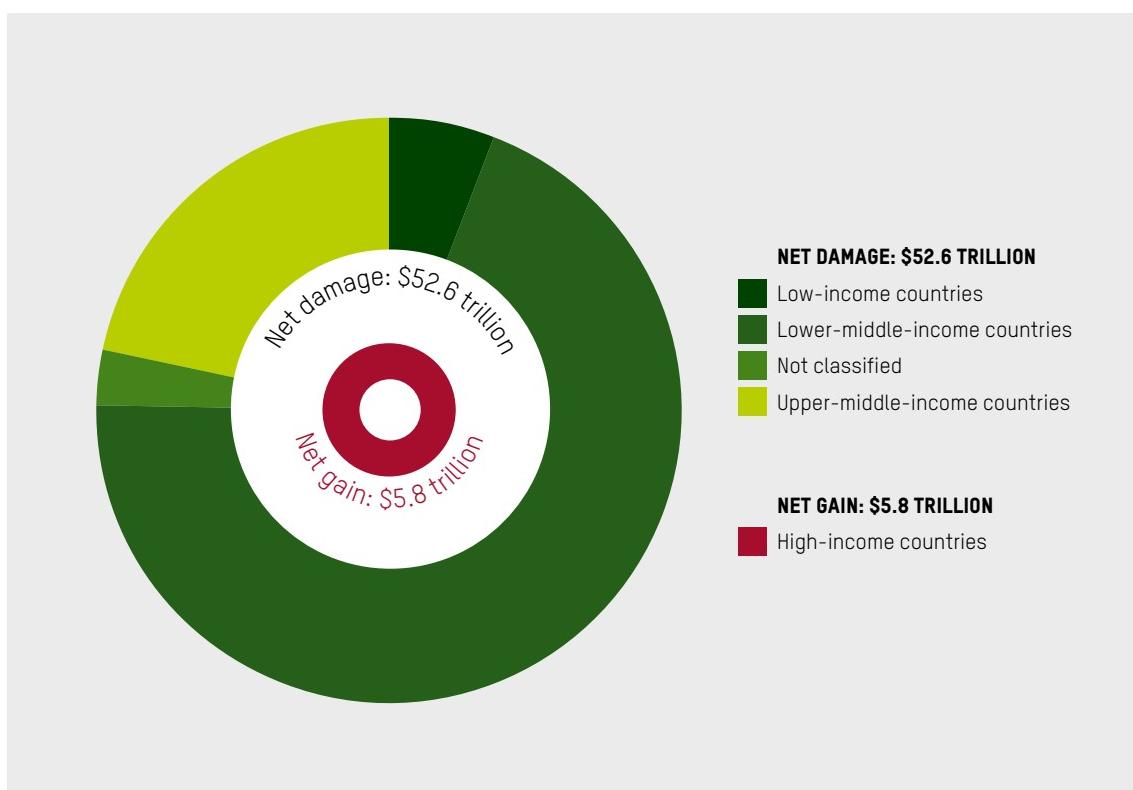
- Oxfam calculates that about one decade of 50 of the world's richest billionaires' investment emissions alone (between 2018 and 2028) will cause \$250bn of economic damage by 2050. This is equivalent to the current economic output of countries such as Ecuador and Bulgaria.⁶⁵

Driving up global inequality

The outsized consumption emissions of the world's super-rich 1% over four decades (1990–2030) alone are causing significant net economic damage, with low- and lower-middle-income countries being most affected. Between 1990 and 2050, low- and lower-middle-income countries will accrue economic damage totalling \$44 trillion. By contrast, high-income countries are benefiting economically, accruing economic gains totalling \$5.8 trillion ([Figure 5](#)).

FIGURE 5 LOW- AND LOWER-MIDDLE-INCOME COUNTRIES WILL ACCRUE MOST ECONOMIC (NET) DAMAGE, WHILE HIGH-INCOME COUNTRIES ACCRUE ECONOMIC (NET) GAINS FROM WARMING

Doughnut charts showing economic damages and gains (1990–2050) by income classification, caused by the consumption emissions of the world's super-rich 1% (1990–2030)



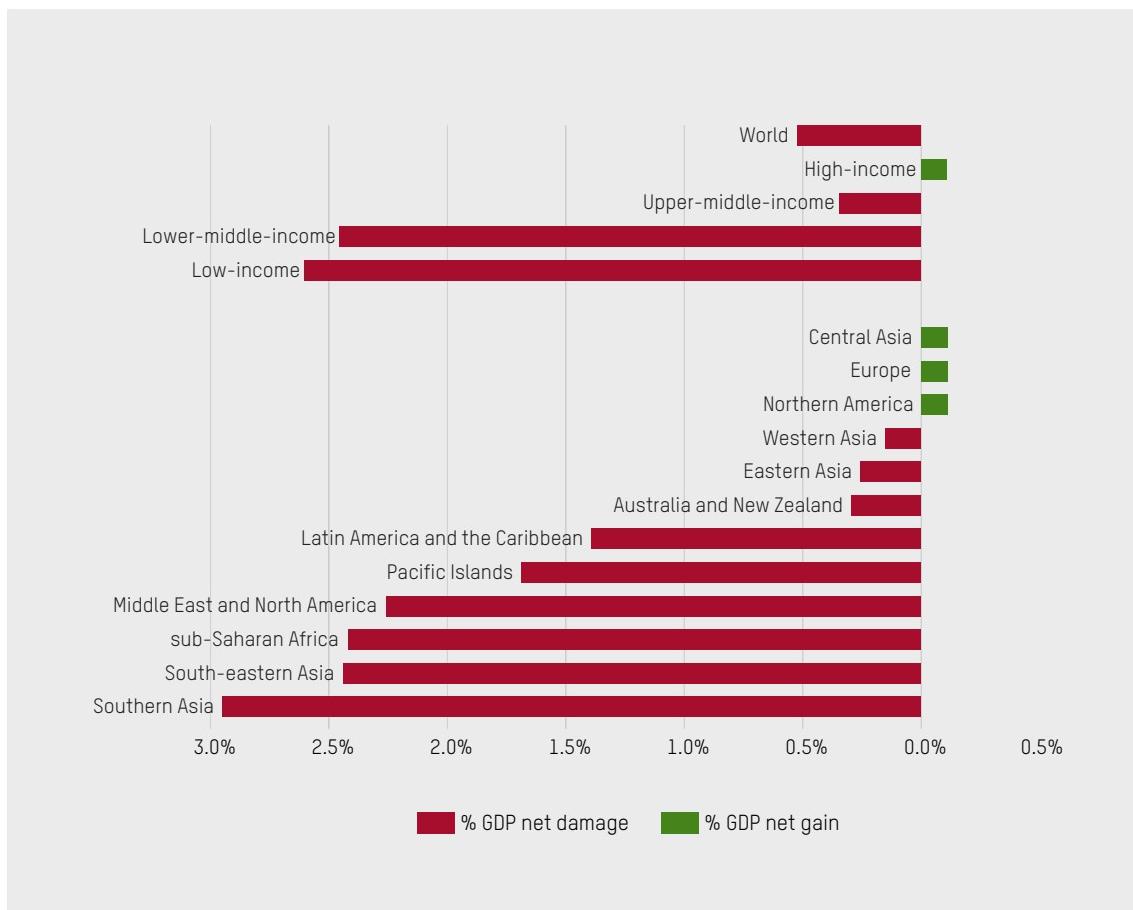
Source: Oxfam. (2024).⁶⁶

Note: The only country covered in the 'not classified' income level is Venezuela. These estimates should be considered highly conservative estimates of the potential losses to the global economy and to individual high-income countries.⁶⁷

As a result of the economic damage they accrue, low- and lower-middle-income countries will lose about 2.5% of their cumulative GDP between 1990 and 2050. Southern Asia, South-East Asia and sub-Saharan Africa (the most affected regions) will lose 3.0%, 2.4% and 2.4%, respectively, of their cumulative GDP by 2050 ([Figure 6](#)). This illustrates a shocking injustice: countries with a large share of the world's super-rich 1% are made yet richer, while countries with a large share of the world's poorest 50%, who have done little to contribute to the climate crisis, are made yet poorer.⁶⁸

FIGURE 6 LOW- AND LOWER-MIDDLE-INCOME COUNTRIES WILL LOSE ALMOST FIVE TIMES MORE GDP THAN THE GLOBAL AVERAGE

Annual average net damage or gain in GDP (%) between 1990 and 2050 caused by four decades of the consumption emissions of the world's super-rich 1% (1990–2030)



Source: Oxfam, 2024.⁶⁹

Note: Economic damage between 1990 and 2050 from consumption emissions from the world's super-rich 1% (1990–2030) is divided by cumulative GDP over the same time period (1990–2050), and expressed as a percentage of cumulative GDP.

Hitting low-income countries hardest

This also illustrates a vicious cycle: poorer and more vulnerable countries are made poorer and more vulnerable. Smaller economies already tend to face limited resources, high levels of indebtedness and severely restricted fiscal space. This means these countries also lack the resources to mitigate and adapt to the effects of the climate crisis.⁷⁰ The economic damage that low- and lower-middle-income countries have already accrued between 1990 and 2023 because of three decades of the consumption emissions of the world's super-rich 1% (1990–2019), is about three times the total officially recorded climate finance that developed countries⁷¹ have given to poorer countries.⁷²

The current lack of adequate climate finance⁷³ (or long-promised development aid) from historically wealthy countries means that poorer countries are being forced to take on billions of dollars in debt to protect themselves from a climate crisis they have barely contributed to. This is outrageous given the significant historical and ongoing debt of Global North countries – where most of the world's richest people live – to the Global South – from colonialism, environmental destruction, and the exploitation of people.

Sub-Saharan Africa and Somalia

Many low-income countries that have contributed little to climate change are concentrated in sub-Saharan Africa. These nations are particularly vulnerable to economic shocks as they tend to rely on agriculture for a large part of their economic output, and a large share of their workforces are in agriculture, a sector that is highly exposed to heat and has high rates of informal employment and working poverty (**Box 4**).⁷⁴

The many women employed in subsistence agriculture are particularly at risk of income losses due to heat.⁷⁵ A UN Food and Agriculture Organization (FAO) study of 380,000 rural households, including in sub-Saharan Africa, found that extreme temperatures already reduce the incomes of rural female-headed households significantly more than those of male-headed households. The study estimates that a 1°C increase in long-term average temperatures reduces the average income of female-headed households by 34% compared to that of male-headed households, further widening the income gap between men and women.⁷⁶

Box 4. Case study: pastoral communities in Somalia

Pastoralism is one of the main livelihood options for millions of people in Somalia and livestock production has been the backbone of the Somali economy for many centuries.⁷⁷ Somalia has historically suffered fluctuating climatic conditions which have worsened over time due to climate change.⁷⁸ Pastoralists are highly exposed to climate-related shocks and are highly vulnerable to income loss as they already have the highest poverty rates in Somalia.⁷⁹

Income loss caused by the emissions of the rich worsens an already unsustainable and unjust situation for Somali pastoralists. The economic damage between 1990 and 2050 caused by four decades of emissions of the world's super-rich 1% (1990–2030) is equivalent to 3.2% of GDP loss in Somalia.⁸⁰

Recent climate-related events in Somalia illustrate the consequences for people's lives. Five consecutive failed rainy seasons have resulted in devastating livestock loss and subsequent mass displacement, food insecurity and acute malnutrition among pastoralists.⁸¹

'I lost all my animals to the drought. I fled on foot with my children and it took me three days to get to Baidoa. It was a difficult journey as I had no food or water for my children. Some got sick along the way.' (An internally displaced person in Baidoa)

While men often migrate to urban centres to seek new livelihoods, women are more likely to face mobility constraints due to care responsibilities and limited employment opportunities. This can affect their access to better local jobs and to food.⁸²

THE EMISSIONS OF THE RICHEST ARE FUELLED HUNGER

There is growing consensus that climate change is already affecting crop yields⁸³ and that the climate crisis is already one of the leading causes of the steep rise in global hunger.⁸⁴ Oxfam's analysis estimates changes in the yields of major global crops due to changes in temperature. It considers maize, wheat and soy, which are among the most common crops globally.⁸⁵

The findings show that the outsized consumption emissions of the world's super-rich 1% alone are causing significant crop losses. The poorest countries and people are bearing the brunt of the impact.

Killing crops

At a global scale, the findings show that:

- Three decades of the consumption emissions (1990–2019) of the world's super-rich 1% have already caused crop losses that could have provided enough calories to feed 14.5 million people a year between 1990 and 2023 (for maize, wheat and soy combined). This will rise to 46 million people a year between 2023 and 2050 due to four decades of consumption emissions (1990–2030) by the world's super-rich 1% only (for maize, wheat and soy combined).⁸⁶
- The crop losses caused by the consumption emissions (1990–2019) of the world's richest 10% could have provided enough calories to feed a staggering 48.2 million people a year between 1990 and 2023. To put this number into perspective, recent multiple crises, from the COVID-19 pandemic to the war in Ukraine, pushed around 40.7 million additional people into hunger each year between 2019 and 2022.⁸⁷ Between 2023 and 2050, the crop losses induced by four decades of consumption emissions of the world's richest 10% (1990–2030) could provide enough calories to feed a staggering 148.8 million people a year.⁸⁸
- About one decade (2018–2028) of investment emissions by 50 of the world's richest billionaires alone will cause crop losses that could provide enough calories to feed 120,000 people a year between 2028 and 2050.⁸⁹



A dry, cracked agricultural field affected by severe drought and intense heat, with a parched canal running through the middle. Long-term drought and extreme summer temperatures contribute to water scarcity and stress on the land. Credit: piyaset/istockphoto.

Major crop-producing regions will be impacted

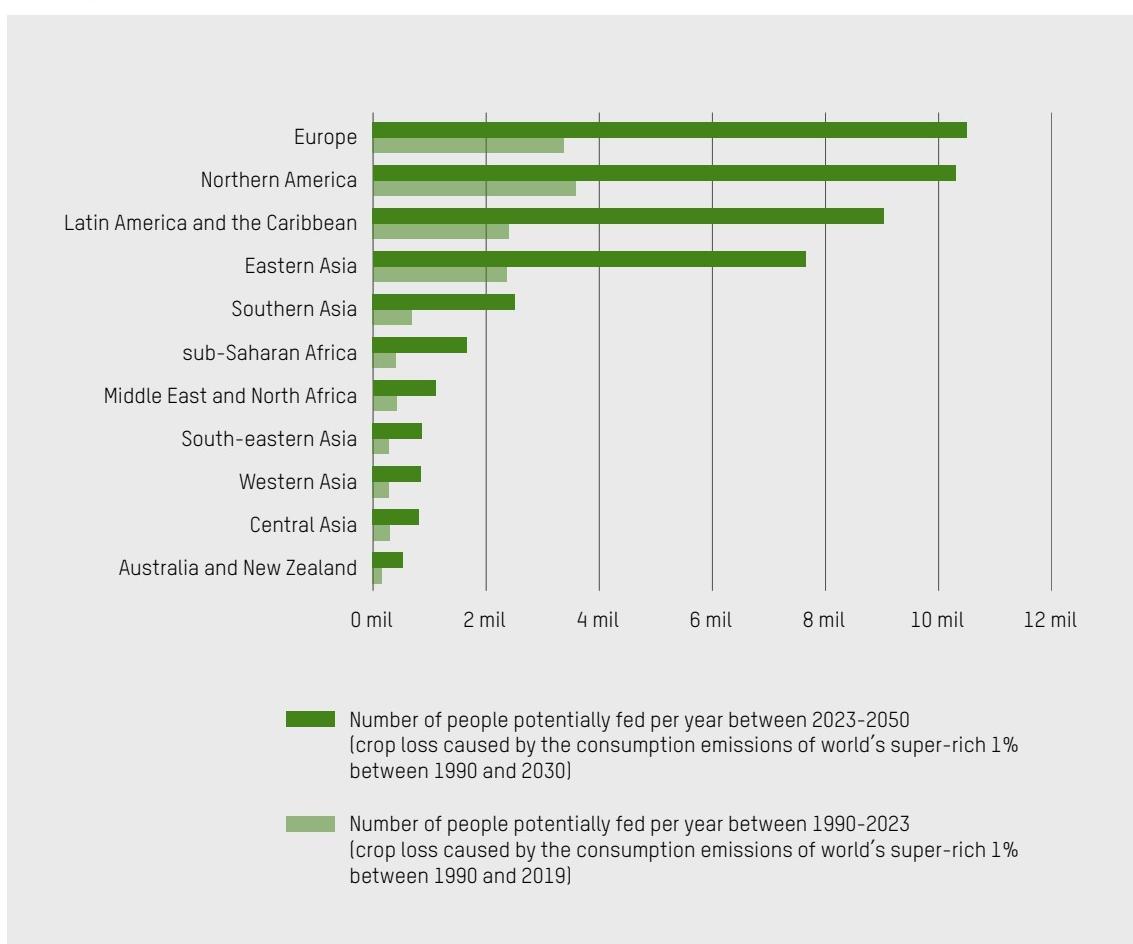
Currently, a limited number of major crop-producing regions produce a large proportion of staple crops globally. Focusing on the consumption emissions of the world's super-rich 1%, their outsized emissions alone will lead to significant crop losses in those regions. Billions of people rely on these crops and any crop losses in these regions will have far-reaching impacts.

The following regions will be most affected (**Figure 7**):

- Northern America and Europe have already accrued crop losses that could have provided enough calories to feed 3.6 million and 3.4 million people a year, respectively, between 1990 and 2023 (wheat, maize, and soy combined). These numbers will rise to 10.3 million and 10.5 million people a year, respectively, between 2023 and 2050. In particular, maize losses in North America and wheat losses in Europe will be considerable by 2050.⁹⁰ This is troubling for importing countries, such as many African countries, where millions of people depend on imports of one or two staple foods – like wheat – for their nutrition.⁹¹ This illustrates the importance of supporting climate-resilient food production locally, instead of over-relying on international trade and a handful of large exporting countries which globally deal with only a few crops.⁹²
- Latin America and the Caribbean have already accrued crop losses that could have provided enough calories to feed 2.4 million people a year between 1990 and 2023 (wheat, maize and soy combined). This number will rise to nine million people a year between 2023 and 2050.⁹³ In Latin America, many families depend on maize for food security and sustenance, and crop losses have direct and serious implications for local food security (**Box 5**). Soy crop losses will also have significant effects on India and China, who are major importers of soy.⁹⁴

FIGURE 7 CROP LOSSES CAUSED BY THE CONSUMPTION EMISSIONS OF THE GLOBAL SUPER-RICH 1%

Regional crop loss of wheat, maize and soy combined, expressed in the average number of people potentially fed per year (for the periods 1990–2023 and 2023–2050)



Hitting low-income countries and people living in poverty hardest

Any significant impediment to food production is serious, especially since hunger has been on the rise globally, with the poorest countries and regions suffering most.⁹⁶ Negative impacts on food production caused by climate change are also expected to add pressure on food prices, affecting consumers globally through higher prices, with low-income consumers particularly at risk.⁹⁷ Hundreds of millions of people live in extreme poverty and have already struggled through multiple crises, including the COVID-19 pandemic, in recent years. Crop losses and hunger caused by the emissions of the richest people will worsen an already unsustainable and unjust situation for them and further swell the ranks of those experiencing poverty and precarity.

Globally, hunger already disproportionately affects women.⁹⁸ Higher temperatures and increased concentrations of CO₂ in the air lead to lower levels of nutrients such as iron in crops such as soy and wheat,⁹⁹ worsening the health of millions of women and girls who are already suffering from iron deficiency.¹⁰⁰

Box 5. Case study: crop loss and hunger in rural communities in Honduras and Colombia

Many rural communities in Honduras and Colombia are highly dependent on the small-scale production of crops such as maize (corn) for self-consumption and income. Stories collected from five rural communities in southern Honduras and northern Colombia show that communities already experience drastic crop losses due to the changing climate, rising temperatures, and changes in rainfall periods and intensity.¹⁰¹

'You could grow corn or watermelon here; you could reap what you sowed ... today it's no longer possible. I have a little piece of land here, and it's not even suitable for cattle ... This land is sand; you can dig and dig, and you're never going to find stone, only sand ... The land is no longer producing as many crops as it used to.'

(Man from the community of El Venado, Honduras, 2023)

Crop losses due to seasonal changes or extreme weather events lead to increased hunger in these communities. The communities also experience less quantifiable impacts due to crop losses. The communities of Barrancas and Urumita in northern Colombia reported that community members experience severe mental health issues, especially anxiety and depression associated with debts acquired due to crop losses. For the community of Barrancas, the loss of productivity derived from changes in the climate and the pollution of local ecosystems have led to the loss of ancestral foods such as *chiqui-chiqui*, a traditional sweet made from cariaco corn that is no longer available.

THE EMISSIONS OF THE RICHEST ARE FUELLED EXCESS DEATHS

When people are exposed to extreme heat, the risk of suffering from potentially deadly illnesses rises steeply. Heat exhaustion and heatstroke occur when the human body can no longer control its temperature,¹⁰² and exposure to excessive heat can also contribute to deaths from heart attacks, strokes and other forms of cardiovascular disease.¹⁰³ According to the IPCC's *Sixth Assessment Report*, the frequency and intensity of heatwaves has already increased over the past decades, and this is only predicted to get worse in the future.¹⁰⁴

As a result, the number of people exposed to extreme heat is growing exponentially¹⁰⁵ and various studies predict a drastic increase of excess deaths due to heat.¹⁰⁶ Based on a recent study,¹⁰⁷ Oxfam has estimated the numbers of deaths attributable to the emissions of the richest people, finding that even in an optimistic climate change scenario,¹⁰⁸ just four years of their emissions are driving up global temperatures enough to contribute to a shocking number of excess deaths.

Killing people

At a global scale, the findings show that:

- Just four years (2015–2019) of the consumption emissions of the world's super-rich 1% are enough to cause 1.5 million excess deaths between 2020 and 2120.¹⁰⁹ This equates to just over 15,000 excess deaths per year over the subsequent century to 2120, which is higher than the current annual death toll due to natural disasters.¹¹⁰
- The impact of the consumption emissions of the world's richest 10% for the same period is a staggering 4.8 million excess deaths, or 47,600 per year, up to 2120.¹¹¹
- Just four years (2021–2025) of the investment emissions of 50 of the world's richest billionaires are enough to cause around 34,000 excess deaths between 2026 and 2126.¹¹²

Bold climate action offers a lifeline. For example, if the world's super-rich 1% had halved their emissions between 2015 and 2019, 756,000 lives could have been saved. If 50 of the world's richest billionaires had placed their investments only in a low-carbon intensity equity fund between 2021 and 2025, the emissions reductions would have saved about 12,000 lives.

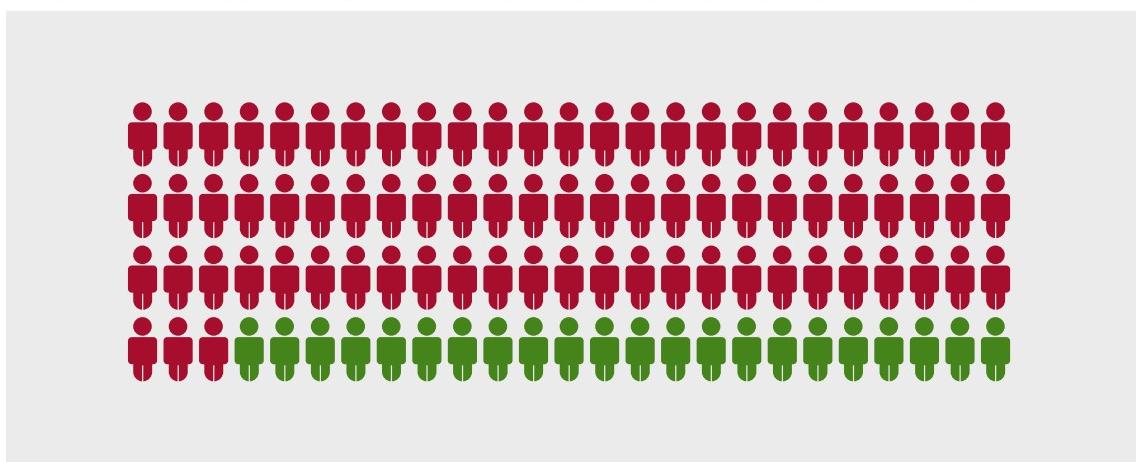
Bold climate action offers a lifeline.

Adaptation measures will also be crucial to save lives. The calculated numbers of excess deaths above assume that countries will become richer, and that additional income is available and used to invest in adaptation measures – such as air-conditioning – to reduce the risk of deaths due to heat. If countries will remain as ill-equipped to protect their populations from heat as they are today, the estimated number of deaths is much higher.¹¹³

Hitting low- and lower-income countries hardest

Most of these estimated deaths will occur in regions with higher numbers of people living in poverty. For example, of the 1.5 million excess deaths caused by the emissions of the world's super-rich 1%, Oxfam's analysis finds that 1.18 million or 78% of excess deaths due to heat will occur in low- and lower-middle-income countries, while the number of deaths in high-income countries will not be as severe.¹¹⁴ Richer countries have a greater capacity to invest in adaptation measures, as do richer individuals.¹¹⁵ While the rich can afford to protect themselves, their excessive emissions are causing deaths elsewhere.

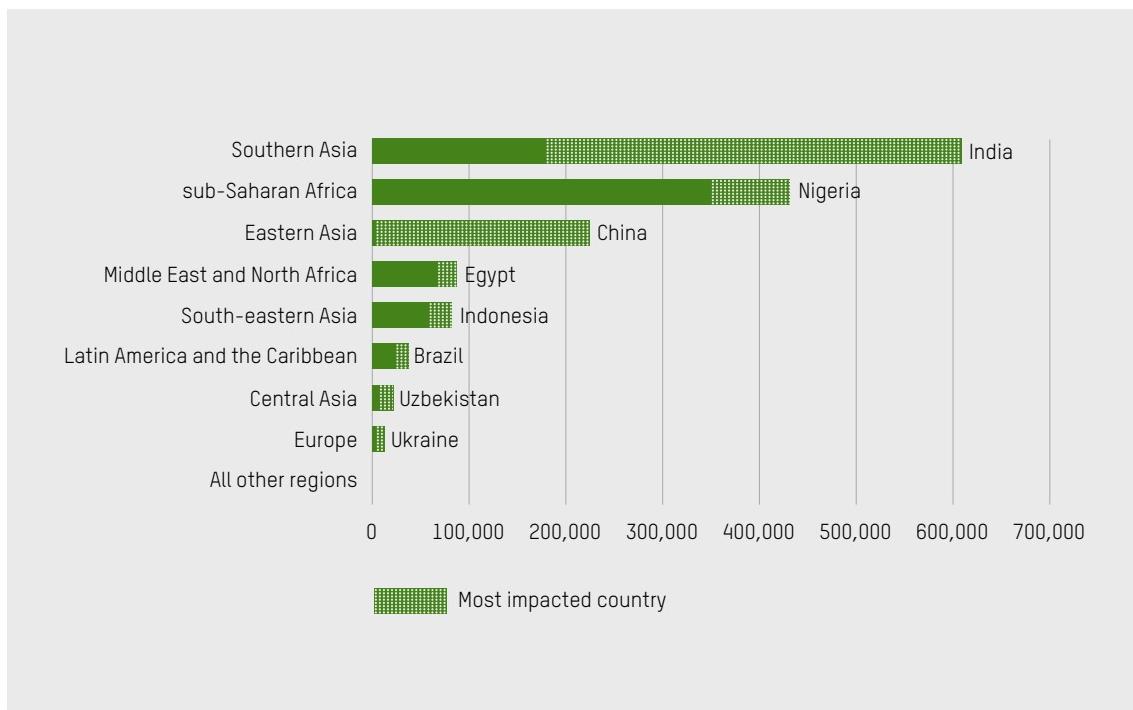
FIGURE 8 78% OF PEOPLE WHO WILL DIE FROM EXTREME HEAT BETWEEN 2020 AND 2120 DUE TO THE EMISSIONS OF THE SUPER-RICH 1%, WILL BE CITIZENS OF LOW- AND LOWER-MIDDLE-INCOME COUNTRIES



Oxfam's analysis finds that most people who will die are in Southern Asia, followed by sub-Saharan Africa ([Figure 9](#)). Around 40% of excess deaths will occur in Southern Asia, with India accounting for most of these excess deaths (70%). Around 29% of excess deaths will occur in sub-Saharan Africa, with Nigeria accounting for most of these excess deaths (19%).

FIGURE 9 SOUTHERN ASIA AND SUB-SAHARAN AFRICA HIT HARDEST

Total number of excess deaths due to heat in regions between 2020 and 2120 caused by four years of consumption emissions of the world's super-rich 1% (2015–2019)



Source: Oxfam, 2024.¹¹⁷

The effects of heat are not, however, experienced evenly across social groups. Studies have pointed to the impact of various factors that make people more physiologically susceptible to heat. In all countries, people who are more susceptible to heat due to their age and pre-existing conditions, or who are more exposed to heat due to their setting (urban versus rural) or occupation (working outdoors versus in air-conditioned offices), are at greater risk. People living in poverty are generally at much greater risk than rich people. The temperature difference between a slum and a wealthy neighbourhood is dramatic, and it can mean the difference between life and death. In Mumbai, India, the vast Dharavi slum gets more than 5°C hotter than the neighbouring gated communities inhabited by middle-class residents.¹¹⁸ Societal disadvantages based on gender, religion, caste, race, class, and migration further increase this risk ([Box 6](#)).¹¹⁹

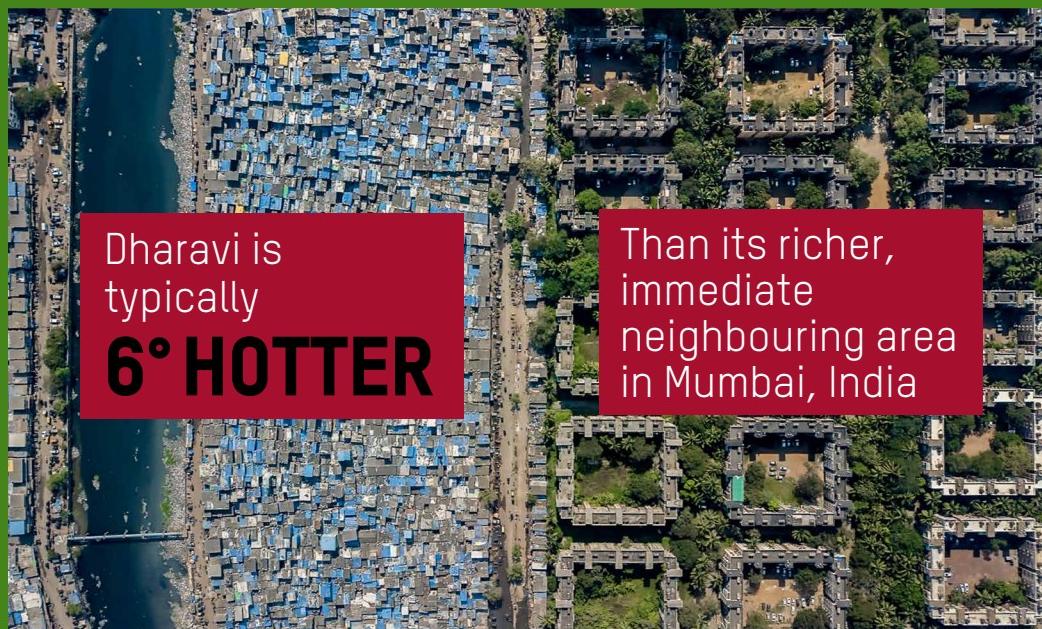
Box 6. India will experience the most excess deaths due to heat

India will be the country that is most affected by heat, with horrific consequences for the Indian population. Oxfam's analysis finds that around 430,000 Indian citizens will die between 2020 and 2120 because of just four years (2015–2019) of emissions by the world's super-rich 1%. This equates to about 4,300 excess deaths a year.¹²⁰

The main summer months – April, May and June – are always hot in most parts of India, but the heat has become more intense in the past decade, further fuelled by the emissions of the richest. People in India are expected to face even more frequent and longer heatwaves in the future.

As the frequency and intensity of heatwaves increase, so does their impact. Between 1 March and 18 June 2024, at least 110 people died after suffering from heatstroke, according to Health Ministry data.¹²¹ Certain groups are more at risk. For example, news reports focused on the particularly severe impacts of heat on low-income households, including many outdoor workers in Delhi who often live in cramped one-room apartments without proper ventilation or cooling systems.¹²²

A recent study highlighted that Indian women have faced significantly more harm due to extreme temperatures than men, with heat-related mortality between 1990 and 2020 being higher in women.¹²³ Another study concluded that more women than men died during a heatwave in Ahmedabad in 2010 when temperatures reached 47.8°C (118°F).¹²⁴ While the studies could not draw definitive conclusions as to why, experts point to cultural norms and societal expectations which limit women's ability to respond and cope effectively to extreme temperature risks.¹²⁵





A woman draws water from a well in Rajasthan, India. Credit: hadynyah/istockphoto (2020).

SECTION 3

TIME TO MAKE RICH POLLUTERS PAY



SECTION 3. TIME TO MAKE RICH POLLUTERS PAY

The emissions of the rich are pushing our planet to breaking point and exacerbating inequality. They are exhausting our precious carbon budget on excessive luxuries and ever-more wealth accumulation, with direct and devastating consequences for the planet and for the world's poorest countries and communities. We cannot avert total climate breakdown unless the world's richest individuals are required to make dramatic and immediate reductions in emissions.

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They, along with historically high-emitting rich countries and polluting corporations, have the responsibility and the capacity to reduce emissions first and fastest. They also bear the responsibility to fund measures to tackle the climate catastrophe they have created, as well as to pay for the past and future impact on the low-income countries and people living in poverty. Current pledges for the Loss and Damage fund, that was agreed at COP28 in Dubai, are minuscule compared to the needs.¹²⁶

To address the climate and inequality crises, governments must step up and prioritize the following actions to reduce emissions, make rich polluters pay, and create new systems that prioritize human and planetary flourishing. People and social movements around the world must also unite to build alternatives and push governments to make radical and progressive changes before it is too late.

RECOMMENDATIONS

1. REDUCE THE EMISSIONS OF THE RICHEST

Action to tackle excessive planet-destroying emissions cannot wait any longer. To safeguard the future of life on our planet, governments must:

a. Produce and implement ambitious climate plans to reduce emissions according to the requirements of the Paris Agreement. This means meeting their Nationally Determined Contributions (NDCs) by 2025 based on the fair share principle¹²⁷ and on limiting warming to 1.5°C. Rich countries in the Global North – where many of the world's richest live and have lived historically – have contributed to 92% of excess emissions.¹²⁸ They have the greatest responsibility to cut emissions, and to do so first and fastest.

These national plans should include measures to phase out fossil fuels and assist low- and middle-income households to cope with the transition to low-carbon economies, as well as measures to significantly reduce the emissions of the richest individuals. They should also outline the financial contributions of the richest to support climate adaptation for communities at risk and to facilitate a just transition.¹²⁹

b. Tax the super-rich to curb their excessive consumption and investment emissions, and their role in propping up polluting industries. This means:

- Introducing a range of permanent progressive income and wealth taxes on the world's richest 1%. A tax of 60% on the incomes of the richest 1% of earners globally would cut emissions equivalent to more than the UK's total emissions in 2019.¹³⁰ Rates must also be high enough to meaningfully reduce economic inequality: as long as the number and wealth of super-rich individuals grows so will their consumption and investment emissions.
- Charging an *additional* higher rate of tax on wealth and (individual and corporate) income from polluting investments to specifically target carbon pollution. For example, a tax on the proportion of profits from the sale of fossil fuels or products running on them. Rates should be high enough to disincentivize investment in polluting industries.
- Taxing the excess profits of corporations gained via disproportionate control over markets or through exceptional windfalls.

c. Ban or punitively tax carbon-intensive luxury consumptions, starting with private jets, superyachts, sports utility vehicles (SUVs), and frequent air travel.

Governments should ban private jets and superyachts, as these luxury emissions significantly contribute to climate breakdown. Such measures are appropriate and necessary steps to address the urgent climate crisis.

Alternatively, luxuries should be taxed at punitive rates (90% or above). Taxes on such luxuries would disincentivize excessive consumption while raising revenue from the richest people that could be invested in national climate plans.

d. Regulate corporations and investors to radically and fairly reduce their carbon emissions.
Corporations should be required to:

- Provide full disclosure of Scope 1, 2 and 3 emissions¹³¹ across operations and supply chains, with independent verification.
- Carry out ongoing reporting on their progress towards achieving emissions reduction targets.
- Establish ambitious science-based targets and a clearly defined roadmap for reducing emissions across all scopes, consistent with the objectives of the Paris Agreement.¹³²

2. MAKE RICH POLLUTERS PAY

Climate finance needs are enormous and escalating, especially in Global South countries that are bearing the brunt of the impact of climate changes. High-income countries not only have the greatest ability to pay the climate bill, they also have a responsibility to compensate for their historic carbon emissions and ongoing neocolonial extractive practices.

Yet there is no indication that they will accept this responsibility. Developed countries¹³³ failed to keep their US\$100bn climate finance promise,¹³⁴ and heading into COP29 there is no indication that they will set a new climate finance goal that meets realistic climate financing needs. They also continue to resist calls for reparations.

Oxfam estimates that low- and middle-income countries need at least US\$18.9 trillion between now and 2030 for adequate climate action.¹³⁵ Civil society estimates that in addition to this, the Global North owes the Global South a climate debt of US\$5 trillion between 2025 and 2050 to compensate for their past exploitation of nature and people.¹³⁶

The argument that ‘there is no money’ does not hold water. If governments were willing to make rich high-polluting individuals and corporations pay, they could start raising the scale of financing truly needed. For example, governments could raise:

- **At least US\$1.7 trillion per year** with a wealth tax on the world’s millionaires and billionaires.
- **An additional US\$100bn** from a wealth tax on investments in polluting activities.
- **Around US\$6.4 trillion per year** with an income tax of 60% on the top 1% of earners globally.
- **Up to US\$941bn** through a windfall corporate profits tax on 722 of the world’s largest corporations, who together raked in over US\$1 trillion in windfall profits per year in 2022 and 2023.

FIGURE 10 RAISING THE SCALE OF FINANCING



Governments must implement a new wave of taxes on the corporations and billionaires who have profited from plundering our world, starting with windfall profits. Trillions of dollars from these new taxes can be invested in public services, technologies, and goods that are designed for and by the people, focusing particularly on women and girls, racialized people, and other groups who are most impacted by climate breakdown. These actions will rapidly build a fairer, greener world, including the provision of universal and accessible renewable energy, energy-efficient and safe housing, high-speed rail and other public transport, protection for all against extreme weather, and support for losses and damages already incurred.

It is time for governments to make rich polluters pay. High-income countries must use a portion of the revenue to meet their international climate finance responsibilities in full.



Governments must implement an ambitious package of progressive taxes on the income and wealth of the richest individuals and on the profits of the largest corporations. Credit: Ralf Hahn/istockphoto.

3. REIMAGINE OUR ECONOMIES AND SOCIETIES TO DELIVER WELLBEING AND PLANETARY FLOURISHING

To address the intertwined crises of inequality and climate change, we must establish new systems and measures that promote the twin goals of human wellbeing and planetary flourishing. The current economic system, designed to accumulate wealth for the already rich through relentless extraction and consumption, has long undermined a truly sustainable and equitable future for all. This system, rooted in racism and sexism, exploits both people and natural resources, pushing us towards disaster. We must shift away from an obsession with economic growth of any kind, and end the cycle of endless extraction and overconsumption at any cost. It is time to put people back in charge of their destiny, and ensure that democratically elected governments, not corporations, shape our economy.

All governments must:

- **Set targets to radically reduce economic inequality.** A significant and sustained reduction in the gap between the richest people and the rest of the world is the only thing that can stop climate change and deliver social justice. Governments should commit to a global inequality goal that dramatically reduces inequality between the Global North and the Global South. Both globally and at national level, the incomes of the top 10% should be no higher than the bottom 40%. Country-owned national plans to reduce inequality must be developed through participatory processes involving all groups within the population.
- **Go beyond the flawed goal of GDP growth** and put new measures of progress at the heart of public policy measures. These must centre on equality, human wellbeing and planetary health. They must reflect how income and wealth are distributed, and fully account for the unpaid and care work disproportionately done by women and marginalized people.¹³⁷
- **Reject neoliberal economics** and put the state at the centre of delivering healthy and prosperous societies that are good for people and the planet. This means rejecting the assumption that the only way to transform our society away from fossil fuel dependence is by enabling and/or subsidizing private actors. It also means committing to strategic public investment in research and development, service provision, renewable energy, and low-carbon public transport and infrastructure.
- **Rebalance global institutions** such as the International Monetary Fund (IMF), the World Bank and the World Trade Organization (WTO), to ensure that Global South countries have the autonomy and policy space to build a better future for their people.

ENDNOTES

- 1 United Nations Climate Change. *The Paris Agreement*. Accessed 30 September 2024. <https://unfccc.int/process-and-meetings/the-paris-agreement>
- 2 Intergovernmental Panel on Climate Change (IPCC). (2019). *Global Warming of 1.5°C: An IPCC Special Report on the Impacts of Global Warming of 1.5°C Above Pre-Industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty*, p. 44. Cambridge: Cambridge University Press. https://www.ipcc.ch/site/assets/uploads/sites/2/2022/06/SR15_Full_Report_LR.pdf
- 3 World Meteorological Association. (13 September 2024). Record-breaking temperatures continue in August. Accessed 3 October 2024. [https://wmo.int/media/news/record-breaking-temperatures-continue-august#:~:text=The%20northern%20hemisphere%20\(boreal\)%20summer,available%20in%20the%20coming%20days](https://wmo.int/media/news/record-breaking-temperatures-continue-august#:~:text=The%20northern%20hemisphere%20(boreal)%20summer,available%20in%20the%20coming%20days)
- 4 R.D. Lamboll, Z.R.J. Nicholls, C.J. Smith, J.S. Kikstra, E. Byers and J. Rogelj. (2023). 'Assessing the Size and Uncertainty of Remaining Carbon Budgets'. *Nature Climate Change*, 13, 1360–7. <https://doi.org/10.1038/s41558-023-01848-5>
- 5 Ibid.
- 6 A. Khalfan et al. (2023). *Climate Equality: A Planet for the 99%*. Accessed 8 October. <https://policy-practice.oxfam.org/resources/climate-equality-a-planet-for-the-99-621551/>
- 7 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 8 The Guardian. (2021). *Make Extreme Wealth Extinct: It's the Only Way to Avoid Climate Breakdown*. Accessed 2 October 2024. <https://www.theguardian.com/commentisfree/2021/nov/10/extreme-wealth-polluting-climate-breakdown-rich#:~:text=A%20superyacht%20alone%2C%20kept%20on,does%20not%20possess%20a%20yacht>
- 9 Wealth-X. (2021). *Spotlight on Private Jet Owners 2021*. Retrieved from: https://go.wealthx.com/l/311771/2021-08-02/nkjpf/311771/16279142730ArL01Rg/Wealth_X_Spotlight_on_Private_Jet_Owners_2021.pdf
- 10 T. Gore. (2022). *Confronting carbon inequality - Putting climate justice at the heart of the COVID-19 recovery*. Oxfam International. Accessed 16 July 2024. <https://policy-practice.oxfam.org/resources/confronting-carbon-inequality-putting-climate-justice-at-the-heart-of-the-covid-621052/>
- 11 A. Khalfan et al. (2023). *Climate Equality: A Planet for the 99%*, op. cit.
- 12 Section 1; and Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 13 A. Khalfan et al. (2023). *Climate Equality: A Planet for the 99%*, op. cit.; T. Gore. (2021). *Carbon Inequality in 2030*, op. cit.
- 14 Oxfam International. (2023). *Unfair Share: Unequal Climate Finance to East Africa's Hunger Crisis*. Accessed 16 July 2024. <https://oi-files-d8-prod.s3.eu-west-2.amazonaws.com/s3fs-public/2023-09/african-fair-share-report.v5.pdf>
- 15 PCC. (2018). *Special Report on Global Warming of 1.5 °C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*. V. Masson-Delmotte et al. (eds.). pp. 3–24 Cambridge University Press, Cambridge, UK and New York, NY, USA.
- 16 A. Khalfan et al. (2023). *Climate Equality: A Planet for the 99%*, op. cit.
- 17 Ibid.
- 18 S. Gössling and A. Humpe. (2020). 'The Global Scale, Distribution and Growth of Aviation: Implications for Climate Change'. *Global Environmental Change*, 65, 102194. <https://doi.org/10.1016/j.gloenvcha.2020.102194>
- 19 Possible. (2023). *Jetting away with it*. Accessed 30 September 2024. <https://www.wearepossible.org/latest-news/jetting-away-with-it>
- 20 C. Collins, O. Ocampo, and K. Thomhave. (2023). *High Flyers 2023: How Ultra-Rich Private Jet Travel Costs the Rest of Us and Burns Up Our Planet*. Patriotic Millionaires and the Institute for Policy Studies. Accessed 16 July 2024. <https://ips-dc.org/wp-content/uploads/2023/04/High-Fliers-2023-Report.pdf>

- 21 J. Beevor, R. Bryher and K. Alexander. (2023). *Jetting Away with It: How Private Jets Pollute the Most and Pay the Least*. Possible. Accessed 16 July 2024. https://docs.google.com/document/d/1WdGEPGb-7W5QvomzJCmtSDwG_NdvtcU3zxzpQNIz-mHo/edit#heading=h.u6xdl3y0oc6d
- 22 H. Towey. (8 May 2023). *A millionaire who says flying private is as addictive as cocaine is selling his jet after learning how terrible it is for the environment*. Business Insider India. Accessed 16 July 2024. <https://www.businessinsider.in/thelife/news/a-millionaire-who-says-flying-private-is-as-addictive-as-cocaine-is-selling-his-jet-after-learning-how-terrible-it-is-for-the-environment/articleshow/100080838.cms>
- 23 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 24 L. Ropke. (23 May 2024). *Congress is cracking down on private jet tracking – including Taylor Swift's*. Quartz. Accessed 16 July 2024. <https://qz.com/congress-has-cracked-down-on-private-jet-tracking-1851494954>
- 25 P. Kavilanz. (20 October 2022). *Twitterverse vigilance scares LVMH CEO into dumping his private plane*. CNN. Accessed 16 July 2024. <https://edition.cnn.com/2022/10/19/business/bernard-arnault-sells-private-jet-over-twitter-tracking/index.html>
- 26 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 27 Forbes. (2024). *World's Billionaire List*. Accessed 1 October 2024. <https://www.forbes.com/billionaires/>
- 28 Wealth-X. (2021). *Spotlight on Private Jet Owners 2021*. Retrieved from: https://go.wealthx.com/l/311771/2021-08-02/nkjpf/311771/16279142730ArL01Rg/Wealth_X_Spotlight_on_Private_Jet_Owners_2021.pdf
- 29 F. Street. (4 April 2023). *Amsterdam Schiphol Airport proposes a ban on private jets*. CNN. Accessed 16 July 2024. <https://edition.cnn.com/travel/article/amsterdam-schiphol-airport-proposes-ban-private-jets/index.html>
- 30 Schiphol. (28 September 2023). *Fewer flights and private jets at Schiphol*. Press release. Accessed 16 July 2024. <https://news.schiphol.com/fewer-flights-and-private-jets-at-schiphol>
- 31 International Institute of Marine Surveying. (13 August 2021). *The State of Yachting 2021 report from SuperYacht Times*. Accessed 16 July 2024. <https://www.iims.org.uk/the-state-of-yachting-2021-report-from-superyacht-times>
- 32 J. Roy, P. Shallcross, A.M. Hardy and S. Burnay. (2011). *Reducing the Environmental Impact of Large Yachts*. Accessed 16 July 2024. <https://bmtmarketing.azureedge.net/media/2295/2011rinasuperyachtconference.pdf>
- 33 J. Fassler. (10 April 2023). *The Superyachts of Billionaires are Starting to Look a Lot Like Theft*. The New York Times. Accessed 16 July 2024. <https://www.nytimes.com/2023/04/10/opinion/superyachts-private-plane-climate-change.html>
- 34 J. Armstrong. (2022). *Climate Impacts of Exemptions to EU's Shipping Proposals*. Transport & Environment. Accessed 16 July 2024. https://www.transportenvironment.org/uploads/files/Climate_Impacts_of_Shipping_Exemptions_Report_updated.pdf
- 35 C. Armstrong. (11 December 2023). *'Megayachts' are environmentally indefensible. The world must ban them*. The Guardian. Accessed 16 July 2024. <https://www.theguardian.com/commentisfree/2023/dec/11/megayachts-environment-carbon-emissions-ban>
- 36 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 37 Ibid.
- 38 Superyacht Fan. <https://www.superyachtfan.com>. Accessed 16 July 2024.
- 39 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 40 Oxfam America. (2024). *Business at an Inhuman Scale*. Accessed 16 July 2024. https://webassets.oxfamamerica.org/media/documents/Amazon-Walmart_Briefing_Note_FINAL.pdf
- 41 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 42 As defined by the US Securities and Exchange Commission (SEC), a principal shareholder is a shareholder who owns at least 10% of the company. These shareholders are considered to have significant influence over a company.

- 43 R. Riddell et al. (2024). *Inequality Inc: How Corporate Power Divides Our World and the Need for a New Era of Public Action*, op. cit.
- 44 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 45 Ibid.
- 46 Research by MIT University has highlighted the massive environmental impact of computation and data storage. The 'cloud' now has a greater carbon footprint than the airline industry, with a single data centre consuming the equivalent electricity of 50,000 homes. S. Gonzalez Monserrate. (2022). *The Staggering Ecological Impacts of Computation and the Cloud*. The MIT Press Reader. Accessed 16 July 2024. <https://thereader.mitpress.mit.edu/the-staggering-ecological-impacts-of-computation-and-the-cloud>
- 47 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 48 Ibid.
- 49 Carbon Disclosure Project (CDP). (2024). *CDP Technical Note: Relevance of Scope 3 Categories by Sector*. Accessed 16 July 2024. https://cdn.cdp.net/cdp-production/cms/guidance_docs/pdfs/000/003/504/original/CDP-technical-note-scope-3-relevance-by-sector.pdf
- 50 CDP. (2020). *CDP Financial Services Disclosure Report 2020: The Time to Green Finance*. Accessed 16 July 2024. <https://cdn.cdp.net/cdp-production/cms/reports/documents/000/005/741/original/CDP-Financial-Services-Disclosure-Report-2020.pdf?1619537981>
- 51 CDP. (2020). *CDP Financial Services Disclosure Report 2020: The Time to Green Finance*. Accessed 16 July 2024. <https://cdn.cdp.net/cdp-production/cms/reports/documents/000/005/741/original/CDP-Financial-Services-Disclosure-Report-2020.pdf?1619537981>
- 52 LobbyMap. (n.d.). *LobbyMap Scores*, op. cit.
- 53 LobbyMap. (n.d.). *About our Scores*, op. cit.
- 54 LobbyMap. (n.d.). *LobbyMap Scores*, op. cit.
- 55 J. Watts. (12 December 2023). *One in four billionaire COP28 delegates made fortunes from polluting industries*. The Guardian. Accessed 16 July 2024. <https://www.theguardian.com/environment/2023/dec/12/one-in-four-billionaire-cop28-delegates-made-fortunes-from-polluting-industries>
- 56 Forbes. (2024). *Forbes World's Billionaires List*. Accessed 16 July 2024. <https://www.forbes.com/billionaires>
- 57 International Renewable Energy Agency (IRENA). (2023). *World Energy Transitions Outlook 2023: 1.5°C Pathway*, p. 175. Accessed 16 July 2024. https://www.irena.org/media/Files/IRENA/Agency/Publication/2023/Jun/IRENA_World_energy_transitions_outlook_2023.pdf?rev=db3ca01ecb4a4ef8accb-31d017934e97
- 58 M. Burke, M. Zahid, N. Diffenbaugh and S.M. Hsiang. (2023). *Quantifying Climate Change Loss and Damage Consistent with a Social Cost of Greenhouse Gases*. Working Paper 31658. National Bureau of Economic Research. Accessed 16 July 2024. <https://doi.org/10.3386/w31658>; C. Lesk, W. Anderson, A. Rigden, O. Coast, J. Jägermeyr, S. McDermid, K.F. Davis and M. Konar. (2022). 'Compound Heat and Moisture Extreme Impacts on Global Crop Yields Under Climate Change'. *Nature Reviews Earth and Environment*, 3(12), 872–89; Bressler. (2024). *The Distributional Mortality and Social Cost of Carbon*. [Unpublished manuscript].
- 59 Kartha et al. (2020.) *The Carbon Inequality Era*. With updated data presented in Oxfam. (2023). *Climate Equality: A planet for the 99%*, op. cit.
- 60 M. Burke et al. (2023). *Quantifying Climate Change Loss and Damage*, op. cit.
- 61 Ibid.
- 62 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 63 World Bank Group. (n.d.). *Rebuilding Economies After COVID-19: Will Countries Recover?* Accessed 16 July 2024. <https://datatopics.worldbank.org/sdgatlas/goal-8-decent-work-and-economic-growth?lang=en#c12>. Original data from World Bank Group. (2024). *Global Economic Prospects*. Accessed 16 July 2024. <https://www.worldbank.org/en/publication/global-economic-prospects>
- 64 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 65 Ibid.
- 66 Based on calculations by Oxfam. World Bank country classification by income level for 2023 is used for the analysis.

- 67 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*. The research presented aligns with earlier work estimating macroeconomic climate damages, using well-established methods for determining national climate damages from an actor's carbon dioxide emissions. Other studies have recently tried to add approaches to include additional damages from localized impacts, extreme changes in temperature and precipitation, and time-lagged effects. These measures tend to increase losses, also in high-income countries, thereby increasing global net damages. Hence, the economic damage estimates presented in this brief should be considered highly conservative estimates of the potential losses to the global economy and to individual countries.
- Callahan, C. W., & Mankin, J. S. (2022). 'National attribution of historical climate damages'. *Climatic Change*, 172(3), 40. <https://doi.org/10.1007/s10584-022-03387-y>; Burke, M., Zahid, M., Diffenbaugh, N., & Hsiang, S. M. (2023). 'Quantifying Climate Change Loss and Damage Consistent with a Social Cost of Greenhouse Gases' (Working Paper 31658). National Bureau of Economic Research. <https://doi.org/10.3386/w31658>; Wadelich, P., Batibeniz, F., Rising, J., Kikstra, J. S., & Seneviratne, S. I. (2024). 'Climate damage projections beyond annual temperature'. *Nature Climate Change*, 1-8.
- 68 A. Khalfan et al. (2023). *Climate Equality: A Planet for the 99%*, op. cit.
- 69 Based on calculations by Oxfam. The regional classification is based on the seven world regions defined by the World Bank. Some world regions are further disaggregated to gain more detailed insights into regional differences. The regional classification of any country can be found in Oxfam. (2024). *Carbon Inequality Kills: Methodology Note*.
- 70 C. Neunuebel. (11 April 2023). *What the World Bank's Country Climate and Development Reports tell us about the debt-climate nexus in low-income countries*. World Resource Institute. Accessed 16 July 2024. <https://www.wri.org/technical-perspectives/what-world-banks-country-climate-and-development-reports-tell-us-about-debt>
- 71 Oxfam is moving away from using terms such as 'developed' or 'developing countries', but since these country groupings are enshrined in the UNFCCC and the Paris Agreement, we use them for clarity when referencing aspects of the international climate regime, including the provision of climate finance.
- 72 The recorded climate finance by the Organization for Economic Co-operation and Development (OECD) between 2013 and 2022. For more details, see Oxfam. (2024). *Carbon Inequality Kills: Methodology note*. However, it should be noted that Oxfam analysis has shown that generous accounting practices have allowed developed countries to overstate the level of support they have actually provided. See, for example: B. Zagema, J. Kowalzig, L. Walsh, A. Hattle, C. Roy, and H.P. Dejaard. (2023). *Climate Finance Shadow Report 2023: Assessing the Delivery of the \$100 Billion Commitment*. Oxfam. Accessed 16 July 2024. <https://policy-practice.oxfam.org/resources/climate-finance-shadow-report-2023-621500>
- 73 B. Zagema et al. (2023). *Climate Finance Shadow Report 2023: Assessing the Delivery of the \$100 Billion Commitment*, op. cit.
- 74 International Labour Organization (ILO). (2019). *Working On a Warmer Planet: The Impact of Heat Stress on Labour Productivity and Decent Work*. Accessed 16 July 2024. https://www.ilo.org/sites/default/files/wcms5/groups/public/@dgreports/@dcomm/@publ/documents/publication/wcms_711919.pdf
- 75 Ibid.
- 76 Food and Agricultural Organization of the United Nations (FAO). (2024). *The Unjust Climate: Measuring the Impacts of Climate Change on Rural Poor, Women and Youth*. Accessed 16 July 2024. <https://www.fao.org/socioeconomic-research-analysis/resources/unjust-climate/the-unjust-climate/en>
- 77 A.H. Mohamud, B. Mat and M.B. Çevrimli. (2022). 'Economic Development Opportunities and General Structure of Livestock Production in Somalia'. *Antakya Veteriner Bilimleri Dergisi*, 1(1), 23-32.
- 78 World Weather Attribution. (27 April 2023). *Human-induced climate change increased drought severity in Horn of Africa*. Accessed 16 July 2024. <https://www.worldweatherattribution.org/human-induced-climate-change-increased-drought-severity-in-southern-horn-of-africa>
- 79 S. Plaza and C. Cerruti. (3 October 2022). *How drought insurance and value chains can support Somalia's livestock economy*. World Bank Blogs. Accessed 16 July 2024. <https://blogs.worldbank.org/en/africa-can/how-drought-insurance-and-value-chains-can-support-somalias-livestock-economy>
- 80 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 81 Case studies collected by Oxfam in Africa.
- 82 B.M. Musau. (2021). 'Effects of Climate Change on Pastoralist Women in the Horn of Africa'. *Journal of Conflict Management & Sustainable Development*, 6(3), 60-76. Accessed 16 July 2024. <https://journalofcmisd.net/wp-content/uploads/2021/05/Effects-of-Climate-Change-on-Pastoralist-Women-in-the-Horn-of-Africa.pdf>

- 83 C. Mbow et al. (2019). 'Food Security'. In *Climate Change and Land: An IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse Gas Fluxes in Terrestrial Ecosystems*, edited by P.R. Shukla et al., pp. 437–550. Cambridge: Cambridge University Press. <https://doi.org/10.1017/9781009157988.007>.
- 84 World Food Programme. (n.d.). *A Global Food Crisis*. Accessed 16 July 2024. <https://www.wfp.org/global-hunger-crisis>
- 85 FAO. (2022). *Agricultural Production Statistics 2000–2021*. FAOSTAT Analytical Brief Series No. 60. Accessed 16 July 2024. <https://openknowledge.fao.org/server/api/core/bitstreams/58971ed8-c831-4ee6-ab0a-e47ea66a7e6a/content>
- 86 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 87 FAO, IFAD, UNICEF, WFP and WHO. (2023). *The State of Food Security and Nutrition in the World 2023: Urbanization, Agrifood Systems Transformation and Healthy Diets Across the Rural–Urban Continuum*. Accessed 16 July 2024. <https://openknowledge.fao.org/server/api/core/bitstreams/8b27c570-2f8b-4350-8d5a-8e82432e6db7/content>
- 88 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 89 Ibid.
- 90 Ibid.
- 91 European Commission. (2022). *Monitoring EU Agri-Food Trade: Developments in September 2022*. Accessed 16 July 2024. https://agriculture.ec.europa.eu/system/files/2022-12/monitoring-agri-food-trade-sep2022_en.pdf
- 92 M. Cohen et al. (2022). *Fixing Our Food; Debunking 10 Myths About the Global Food System and What Drives Hunger*. Oxfam. Accessed 16 July 2024. <https://policy-practice.oxfam.org/resources/fixing-our-food-debunking-10-myths-about-the-global-food-system-and-what-drives-621411>
- 93 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 94 D.A. Llonch. (n.d.). *Soybeans: the other strategic commodity of South America*. Center for Global Affairs & Strategic Studies (GASS) Blogs. Accessed 16 July 2024. <https://www.unav.edu/web/global-affairs/detail/-/blogs/soybeans-the-other-strategic-commodity-of-south-america>
- 95 Based on calculations by Oxfam. The regional classification is based on the seven world regions defined by the World Bank. Some world regions are further disaggregated to gain more detailed insights into regional differences. The regional classification of any country can be found in Oxfam. (2024). *Carbon Inequality Kills: Methodology Note*. Note that the region 'Pacific islands' is missing from this analysis as the Pacific Island countries do not have any notable production of the three crops analysed here.
- 96 FAO et al. (2023). *The State of Food Security and Nutrition in the World 2023*, op. cit.
- 97 C. Mbow et al. (2019). 'Food Security', op. cit.
- 98 FAO et al. (2023). *The State of Food Security and Nutrition in the World 2023*, op. cit.; World Food Programme. (2022). *WFP and Gender Brief*. Accessed 16 July 2024. <https://www.wfp.org/publications/wfp-and-gender-brief>
- 99 C. Mbow et al. (2019). 'Food Security', op. cit.
- 100 Ibid.
- 101 C. Fernández and A.M. Rodríguez. (2024). *Case Studies: Climate Change Loss and Damage in Rural Communities in Honduras and Colombia*. Asociación La Ruta del Clima. Accessed 16 July 2024. https://larutadelclima.org/wp-content/uploads/2024/06/LRDC_OUTPUT-3.-Narrative-Case-Study-Reports-Honduras-and-Colombia.pdf
- 102 A. Morris and G. Patel. (2023). *Heat Stroke*. Accessed 16 July 2024. <https://www.ncbi.nlm.nih.gov/books/NBK537135>
- 103 World Health Organization (WHO). (28 May 2024). *Heat and Health*. Accessed 16 July 2024. <https://www.who.int/news-room/fact-sheets/detail/climate-change-heat-and-health>
- 104 IPCC. (2023). *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, pp. 35–115. IPCC. Accessed 16 July 2024. https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_FullVolume.pdf

- 105 Lancet Countdown. (2023). *Heat-Related Mortality*. Accessed 16 July 2024. <https://www.lancetcountdown.org/data-platform/health-hazards-exposures-and-impacts/1-1-health-and-heat/1-1-5-heat-and-sentiment>
- 106 R.D. Bressler. (2021). 'The Mortality Cost of Carbon'. *Nature Communications*, 12(1), 4467. <https://doi.org/10.1038/s41467-021-24487-w>; T. Carleton, A. Jina, M. Delgado, M. Greenstone, T. Houser, S. Hsiang, ... and A.T. Zhang. (2022). 'Valuing the Global Mortality Consequences of Climate Change Accounting for Adaptation Costs and Benefits'. *The Quarterly Journal of Economics*, 137(4), 2037–105; C. Mora, B. Dousset, I.R. Caldwell, F.E. Powell, R.C. Geronimo, C.R. Bielecki, ... and C. Trauernicht. (2017). 'Global Risk of Deadly Heat.' *Nature Climate Change*, 7(7), 501–06. <https://doi.org/10.1038/nclimate3322>; A. Gasparini, Y. Guo, F. Sera, A.M. Vicedo-Cabrera, V. Huber, S. Tong, ... and B. Armstrong. (2017). 'Projections of Temperature-Related Excess Mortality Under Climate Change Scenarios'. *The Lancet Planetary Health*, 1(9), e360–7.
- 107 Bressler. (2024). *The Distributional Mortality and Social Cost of Carbon*. [Unpublished manuscript].
- 108 Bressler. (2024). *The Distributional Mortality and Social Cost of Carbon*. [Unpublished manuscript]. MCC results are calculated in the RFF-SP emissions scenarios now being used by the US government in which global average temperatures are expected to rise just above 2°C above pre-industrial levels in 2100; K. Rennert, B.C. Prest, W.A. Pizer, R.G. Newell, D. Anthoff, C. Kingdon, ... and F. Errickson. (2021). 'The Social Cost of Carbon: Advances in Long-Term Probabilistic Projections of Population, GDP, Emissions, and Discount Rates'. *Brookings Papers on Economic Activity*, 2021(2), 223–305; US Environmental Protection Agency. (2023). *Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances*. Accessed 16 July 2024. https://www.epa.gov/system/files/documents/2023-12/epa_sc-ghg_2023_report_final.pdf
- 109 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 110 Institute for Health Metrics and Evaluation. (IHME). (2024). *Global Burden of Disease 2021: Findings from the GBD 2021 Study*. Accessed 16 July 2024. <https://www.healthdata.org/research-analysis/library/global-burden-disease-2021-findings-gbd-2021-study>
- 111 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 112 Ibid.
- 113 The estimated number of excess deaths due to heat, assuming countries will not invest in adaptation measures, is: 2.7 million excess deaths for four years of consumption emissions of the world's super-rich 1%, 8.4 million for the world's richest 10%, and 63,500 excess deaths for four years of investment emissions of the world's 50 richest billionaires.
- 114 Bressler. (2024). *The Distributional Mortality and Social Cost of Carbon*. [Unpublished manuscript].
- 115 R.D. Bressler, F.C. Moore, K. Rennert and D. Anthoff. (2021). 'Estimates of Country Level Temperature-Related Mortality Damage Functions'. *Scientific Reports*, 11(1), 20282.
- 116 Calculations by Oxfam, based on research done by Bressler. (2024). *The Distributional Mortality and Social Cost of Carbon*. [Unpublished manuscript]. The World Bank classification by income level for year 2020 is used here.
- 117 Calculations by Oxfam, based on research done by Bressler. (2024). *The Distributional Mortality and Social Cost of Carbon*. [Unpublished manuscript]. The regional classification is based on the seven world regions defined by the World Bank. Some world regions are further disaggregated to gain more detailed insights into regional differences. The regional classification of any country can be found in Oxfam. (2024). *Carbon Inequality Kills: Methodology Note*.
- 118 Hindustan Times. (2023). *Mumbai Slums are 6 Degrees Celsius Warmer than Neighbouring Housing Societies in October: Study*. Accessed 30 September 2024. <https://www.hindustantimes.com/mumbai-news/mumbai-slums-are-6-degrees-celsius-warmer-than-neighbouring-housing-societies-in-october-story-wo22fMA4blUjzvV50ldamN.html>
- 119 C.J. Gronlund, V.J. Berrocal, J.L. White-Newsome, K.C. Conlon and M.S. O'Neill. (2015). 'Vulnerability to Extreme Heat by Socio-Demographic Characteristics and Area Green Space Among the Elderly in Michigan, 1990–2007'. *Environmental Research*, 136, 449–61; D. Kim and J. Lee. (2020). 'Spatial Changes in Work Capacity for Occupations Vulnerable to Heat Stress: Potential Regional Impacts from Global Climate Change'. *Safety and Health at Work*, 11(1), 1–9; D. Osberghaus and T. Abeling. (2022). 'Heat Vulnerability and Adaptation of Low-Income Households in Germany'. *Global Environmental Change*, 72(1), 102446; C.E. Reid, M.S. O'Neill, C.J. Gronlund, S.J. Brines, D.G. Brown, A.V. Diez-Roux, and J. Schwartz. (2009). 'Mapping Community Determinants of Heat Vulnerability'. *Environmental Health Perspectives*, 117(11), 1730–6.

- 120 Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 121 S. Arasu and K. Pathi. (20 June 2024). *Extreme heat in India has killed more than 100 people in the past three and a half months*. Associated Press. Accessed 16 July 2024. <https://apnews.com/article/india-heatwave-deaths-heat-stroke-climate-change-880f26e3b8eeb066d2db2308502783d2>
- 122 *The Economic Times*. (20 May 2024). *Delhi's outdoor workers, low-income households bear brunt of deadly heat*. Accessed 16 July 2024. <https://economictimes.indiatimes.com/news/india/delhis-outdoor-workers-low-income-households-bear-brunt-of-deadly-heat/articleshow/110247802.cms?from=mdr>; S. Mishra. (20 June 2024). *India sees over hundred deaths and 40,000 cases of suspected heatstrokes*. *Independent*. Accessed 16 July 2024. <https://www.independent.co.uk/climate-change/news/india-heat-wave-imd-temperature-heatstroke-b2565746.html>
- 123 Y.-T. Lin, R. Bardhan, R. Debnath, and B. Mukherjee. (2024). *Are heatwaves more deadly for women? Significance*. Accessed 16 July 2024. <https://significancemagazine.com/long-read-are-heatwaves-more-deadly-for-women>
- 124 G.S. Azhar, D. Mavalankar, A. Nori-Sarma, A. Rajiva, P. Dutta, A. Jaiswal, ... and J.J. Hess. (2014). 'Heat-Related Mortality in India: Excess All-Cause Mortality Associated with the 2010 Ahmedabad Heat Wave'. *PLOS ONE*, 9(3), e91831.
- 125 See, for example: R. Bardhan, R. Debnath and B. Mukherjee. (2023). 'Factor in Gender to Beat the Heat in Impoverished Settlements'. *Nature*, 620(7975), 727; A. Rajvanshi. (23 June 2023). *Why women are especially vulnerable during India's deadly heat waves*. *Time*. Accessed 16 July 2024. <https://time.com/6289448/india-extreme-heat-women>
- 126 At COP28, countries pledged close to US\$700m to the newly established loss and damage fund. But loss and damage cost in developing countries is estimated to be between US\$290bn to US\$580bn. Sources: *Integrated Assessment for Identifying Climate Finance Needs for Loss and Damage: A Critical Review*. Accessed 3 October 2024. https://link.springer.com/chapter/10.1007/978-3-319-72026-5_14; United Nations Climate Change. 13 December 2023. *COP28 Agreement Signals "Beginning of the End" of the Fossil Fuel Era*. Accessed 3 October 2024. <https://unfccc.int/news/cop28-agreement-signals-beginning-of-the-end-of-the-fossil-fuel-era>
- 127 The climate fair share principle ensures that each country reduces global emissions fairly, considering historical responsibility, capability, and the right to develop. It aims to balance emission reductions with fairness, so all countries contribute based on their abilities and responsibilities.
- 128 J. Hickel. (2020). 'Quantifying National Responsibility for Climate Breakdown. An Equality-Based Attribution Approach for Carbon Dioxide Emissions in Excess of the Planetary Boundary'. *The Lancet Planetary Health*, 4(9), e399–e404. For this analysis, national fair shares of a safe global carbon budget consistent with the planetary boundary of 350 parts per million (PPM) were derived. These fair shares were then subtracted from countries' actual historical emissions (territorial emissions from 1850 to 1969, and consumption-based emissions from 1970 to 2015) to determine the extent to which each country has overshot or undershot its fair share. Through this approach, each country's share of responsibility for global emissions in excess of the planetary boundary was calculated.
- 129 Definition of 'just transition': the process of moving away from fossil fuels to clean, renewable energy in a way that reduces inequality and prioritizes economic, racial, and gender justice. This involves ensuring that the costs of climate action are borne by wealthy polluters and that vulnerable communities are supported throughout the transition.
- 130 A. Khalfan et al. (2023). *Climate Equality: A Planet for the 99%*, op. cit.; Oxfam. (2024). *Carbon Inequality Kills: Methodology note*.
- 131 Scope 1–3 emissions are an international standard for corporate accounting and reporting emissions, categorizing greenhouse gasses into Scope 1, 2 and 3 based on the source. Scope 1 emissions refer to direct emissions owned or controlled by the company; scope 2 emissions refer to indirect emissions from purchased electricity, heat, or steam; scope 3 emissions refer to other indirect emissions from sources not owned or controlled by the company, such as supply chain, transportation, and product use. Source: World Resources Institute. *Greenhouse Gas Protocol*. Accessed 3 October 2024. <https://www.wri.org/initiatives/greenhouse-gas-protocol#:~:text=WRI%20and%20WBCSD%20created%20GHG%20Protocol>
- 132 United Nations Climate Change. *The Paris Agreement*. Accessed 30 September 2024. <https://unfccc.int/process-and-meetings/the-paris-agreement>
- 133 Oxfam is moving away from using terms such as 'developed' or 'developing countries', but since these country groupings are enshrined in the UNFCCC and the Paris Agreement, we use them for clarity when referencing aspects of the international climate regime, including the provision of climate finance.

- 134 High-income countries say they mobilized nearly US\$116bn in climate finance in 2022 – for the first time surpassing the US\$100bn a year they originally had promised to reach by 2020 to help Global South countries cope with the worsening effects of climate breakdown. However, Oxfam estimates that the ‘true value’ of climate finance provided by rich countries in 2022 is only between US\$28bn and US\$35bn, with at most only US\$15bn earmarked for adaptation. See J. Kowalzig, T. Cherry-Virdee, R. Bo Sørensen, and S. Cutts. (2024). *Climate Finance Short-Changed, 2024 Update: Estimating the Real Value of the \$100 Billion Commitment for 2021–22*. Oxfam International. Accessed 16 July 2024. <https://www.oxfamnovib.nl/Files/rapporten/2024/Climate%20Finance%20Short-Changed%202024.pdf>
- 135 The breakdown is US\$13.7 trillion for climate mitigation, US\$2.8 trillion for loss and damage, and US\$2.4 trillion for climate adaptation; E. Seery and D. Jacobs. (2023). *False Economy: Financial Wizardry Won’t Pay the Bill for a Fair and Sustainable Future*, op. cit.
- 136 Climate Action Network. (20 September 2024). *US\$5 trillion owed to Global South by Global North due to the climate crisis*. Accessed 2 October 2024. <https://climatenetwork.org/2024/09/20/us5trillion-owed-to-global-south-by-global-north-due-to-the-climate-crisis/#:~:text=A%202023%20study%20shows%20that%20by>
- 137 Parvez et al, Radical Pathways Beyond GDP: Why and how we need to pursue feminist and decolonial alternatives urgently. Oxfam discussion paper, August 2023 <https://policy-practice.oxfam.org/resources/radical-pathways-beyond-gdp-621532/>
Eradicating poverty beyond growth Report of the Special Rapporteur on extreme poverty and human rights, Olivier De Schutter. A/HRC/56/61. May 2024 <https://documents.un.org/doc/undoc/gen/g24/069/70/pdf/g2406970.pdf>

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